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UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 540

Contribution from the States Relations Service
A. C. TRUE, Director

Washington, D. C. PROFESSIONAL PAPER July 27, 1917

A FIRST YEAR COURSE IN HOME ECONOMICS FOR SOUTHERN AGRICULTURAL SCHOOLS

By

LOUISE STANLEY, Professor of Home Economics
University of Missouri

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A FIRST-YEAR COURSE IN HOME ECONOMICS FOR SOUTHERN AGRICULTURAL SCHOOLS.[1]

By Louise Stanley, *Professor of Home Economics, University of Missouri.*

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INTRODUCTION.

This bulletin outlines a course of study in home economics for southern high schools. It emphasizes the connection between such instruction and actual home experience and the danger arising from formal methods of presentation. It calls attention to underlying general principles and applies them in a typical course of study, which, while based on southern conditions, is applicable in other communities.

The aim of any course in home economics is to make the girl a better home maker. By teaching her how to do, and the reasons why, and as well by giving insight into the fundamental importance of home making such instruction transforms housework from drudgery into an honored profession. In the average home two industries stand out—sewing and cooking—and there has been a tendency to limit home economics instruction to them. If interpreted broadly to include their economic and hygienic relations, cooking and sewing do furnish the basis of a well-rounded course; but they should be supplemented by other subjects necessary for the home maker. Knowledge of the homes of her community will best assure to the teacher suitable subject matter and connect the school work with home duties.

[1] This bulletin has been prepared in cooperation between the author and C. H. Lane, Chief Specialist in Agricultural Education, as well as specialists of the Office of Home Economics, States Relations Service. It is designed to aid teachers in presenting a course of study in home economics which will connect such instruction and actual home experiences.

83933°—Bull. 540—17——1

The principles involved in the lessons set forth in this publication are fundamental. However, it has been the purpose of the author to present those which have a direct bearing on southern home life. To secure the best results with this work teachers should make a special effort to adapt the lesson topics to the conditions found in the homes of the pupils. The first and most important step in this direction is for the teacher to make a close study of the community conditions, and so to direct the application of the principles given in the lessons as to meet the needs and to improve upon the conditions. Let the teachers keep in mind that communities as well as sections vary as to home-making problems and that a thorough knowledge of the conditions in each instance is necessary to enable the teachers to render the best service.

A complete course in home economics would include the following subjects:[1]

1. Food:
   - (1) Selection (home-grown and purchased food).
   - (2) Preparation.
   - (3) Planning and serving of meals.
2. Shelter:
   - (1) House sanitation.
   - (2) Planning of house.
   - (3) Decoration and furnishing of the house.
   - (4) Care of the house
2. Clothing:
   - (1) Selection.
   - (2) Making.
   - (3) Keeping in repair.
   - (4) Laundry work.
4. Care and training of children:
   - (1) Care of a baby.
   - (2) Problems of a young child.
   - (3) Amusements for children.
5. Hygiene and sanitation:
   - (1) Definition of health.
   - (2) Definition and classification of diseases.
   - (3) Means of preserving health.
6. Home care of the sick.
7. Household management, including systemization of housework, expenses, accounts.
8. Training for the enjoyment of leisure time.

Many of the high schools of the South which teach agriculture and home economics are located in the open country and have dormitories for housing the students, which provide opportunities for practical instruction in home economics comparable to those furnished by the school farms for practical instruction in agriculture. Often much of the food material is raised by the boys on the school farm and much of the household work is done by the girls, thus

[1] See Syllabus of Home Economics, American Home Economics Association, Baltimore, Md.

reducing the expenses of each student to as low as $5 to $6 a month in some schools. In such cases the students may work one to two hours daily, or self-supporting students may do extra work beyond the stated requirement at so much per hour. This practical work serves both to introduce the problems in agriculture and home economics which are the basis of work in the classroom and furnishes the field for their practical application. The daily routine in housework, unless it is supervised, however, is of no educational value; it should be considered a part of the girls' laboratory work and organized accordingly.

Methods of teaching.—Early home economics, which was practical cooking taught by definite recipes copied and followed by the students, was soon modified both in the direction of "culture" by adding informational material from geography, history, and nature study, and in the direction of "science" by teaching applied chemistry and physics, i. e., the principles of these sciences with illustrations drawn from the household. The latter plan really teaches these sciences, however, and not home economics itself. It is now recognized that home economics consists of a definite body of principles, which are best taught as a self-constituted science, i. e., as an organized body of specific facts and principles, rather than as an application of other sciences. The relation of the material to the needs of the girls is in this way more definite and the approach of the subject through the girls' own home experiences is more direct, and the facts learned are better correlated with the needs of everyday life. Using as the basis of the course, therefore, the principles of home economics themselves, the teacher can by proper choice of problems teach the child those facts which are likely to be useful to her, presenting them in the order of their increasing difficulty.

The next matter, that of determining the method by which these problems are to be solved, or the presentation of the individual lesson, is the point at which teachers of home economics are most likely to fail.

How not to teach is well illustrated by a lesson actually observed. The problem was the freezing of water ice. How was it developed? As a first step which removed the necessity for any reasoning on the part of the students, the complete directions were dictated, and each girl took them down verbatim. No opportunity was given to the students in working out this problem to formulate any principles which could be applied to the making of water ices in general. Next the work was parceled out and each girl was given one step in the process, no one having a chance to follow the whole process through. The amount of lemon juice and sugar was arbitrarily stated. The students were not told that the amount of sugar should vary with the acidity of the fruit they used, nor were they allowed to find

this out for themselves. They had no opportunity to see that the mixture tasted sweeter before freezing than it did afterwards, and there was no discussion of this fact. No reason was given for the use of salt with the ice in the freezing mixture nor was the proportion discussed, but arbitrarily given. There was interest in the lesson, but it centered in the eating of the product after it was finished rather than in the principles involved in the making. From this example it may be seen that there is danger of much poor teaching in a subject which has the possibility of as good teaching as any other in the curriculum. While the example cited is of especially bad teaching, it is true in most cases that teachers of home economics tell the students too much, and do not allow them to reason things out sufficiently for themselves. Advocates of the method of teaching by means of problems agree that the subject-matter must be developed gradually in class. The teacher must not tell; the pupil must be required to make plans before she begins to work, and so be made to think things out for herself, keeping at the same time a live interest in technique.

When this method is used in teaching home economics it means that the problems given must be kept quite simple at first and the facts and principles which should grow into the life of the girls be developed gradually, step by step. It means thorough organization of material and thorough understanding on the part of the teacher of the principles involved. It means that students be given a very clear idea of the problems to be solved and trained toward definite standards of work. The danger in such a method lies in the fact that in the interest of learning the reasons for the different steps the standards for results may be lowered and drill on special points missed. This can be obviated by repeating those problems whose results are unsatisfactory and by having drills at stated intervals.

The best method of opening up a lesson is by questions which call to mind past experiences of the students and relate them to the problem (the preparation step in the formal lesson outline). Next there should be a very definite statement of the problem, made clear by additional questions (the presentation step). A list of these questions carefully worked out with a short and definite statement of the problems, should be given at one laboratory period to enable the student to prepare for the next. If the students study this carefully they are ready to start work at the beginning of the next period. An opportunity for questions should be given before starting work, but too much discussion at this point results in "telling." After the work is done the most valuable part of the lesson comes, the comparison of results and discussion of differences, leading to generalizations which form the theory of the subject in

hand. Thus theory grows out of practice, and to make the cycle of knowledge complete, it should be applied again in practice.

The following lesson plan illustrates this method of teaching. To formulate questions the teacher must have in mind a very definite logical outline which the questions will develop, but in actual questioning she should follow the order of the students' own way of thinking. [1]

OUTLINE FOR A LESSON ON SPONGE CAKE.

(This lesson has been preceded by one on omelettes and soufflés, and will be followed by one on custards, or the use of eggs as a means of thickening.)

What do you understand by the term sponge cake? What types of sponge cake have we? What would you say were the characteristics of this group of cakes? What are the necessary constituents? How do they vary in the different types? In what kind of sponge cakes do you use cream of tartar? In which do you use lemon juice? Can you see any reason for this difference? Classify any recipes you may have for this type of cake on the basis of the amounts of the different constituents necessary for each egg.

Sponge cake.—You will find that for each egg in the sponge cake proper the general proportions of flour and sugar are the same, about one-fourth cup of each and one teaspoonful of lemon juice to each egg. Is any other liquid necessary? Upon what will this depend? What is the danger if too much is added? What will be the result if the amount is too little? In what order would you mix the above ingredients? What must be your aim all the time? The egg serves what functions in this cake? If eggs were expensive what two ingredients might you use in their place? To what extent can this substitution be made? Calculate the amount of each you would add as a substitute for one egg.

Let each student make a typical sponge cake, or a cheap sponge cake with one egg. Calculate the cost of each and compare the results. Are we justified in paying extra amount for the typical sponge cake? Is the cheap sponge cake wholly representative of this group?

Angel cake.—In what sense is an egg white equivalent to half an egg? On this basis work out your proportions for the angel cake from those used for the sponge cake. Could you make a cheap angel cake? What would be the limit to the amount of substitution possible here? Why do we add cream of tartar to the angel cake and lemon juice to the sponge cake?

Each student should make an angel cake, using the whites of two eggs. Make this either into a typical or a cheap angel cake. The

[1] The students are expected to answer the questions from their own experience so far as possible. Where their experience along any of these lines has been limited, it may be supplemented by reference to books in the library. Recipe books are especially valuable in giving suggestions as to proportions, combinations, etc.

yolks should be very carefully put away in the jars provided for that purpose as they are to be used at the next laboratory period.

Sunshine cake.—How does the sunshine cake differ from the sponge cake on the one hand and the angel cake on the other? Formulate the proportions for a small sunshine cake. Which would you use in this case, cream of tartar or lemon juice?

Any of the students who wish may substitute sunshine cake for either the sponge or the angel cake.

Baking the cake.—At what temperature did we find that eggs should be cooked? Since the typical sponge cake contains a very large proportion of egg, in what way would this determine the oven temperature? What is going to make your cake light? If the oven is too hot, what will happen to the top of your cake before it is fully raised? What will be the result in the cake? What temperature do you think would be most desirable for baking the above mixture? Would you use different temperatures for the typical and the cheap sponge cake? Reason.

The objections raised to the above method of teaching are three:

1. It is said to be slow and wasteful of material. Experience shows, however, quickness in real progress. While so much ground may not be covered, general principles are acquired, applicable anywhere. The knowledge has become a part of the student; it sticks better. In most cases there is no more waste than in the imitative recipe method. Material is not expensive, and with proper oversight failures are uncommon.

2. It is said that recipes should be standardized by experts and given to others in definite forms. But recipes must be indefinite since (*a*) food materials vary, not being chemically definite substances, and (*b*) the recipe itself varies with the result sought. It is far better to give the girl ability to utilize successfully whatever materials she may have available than to teach her to follow a small number of recipes.

3. It is said that teaching by recipes is the best means we have of cultivating correct food standards in the students, but it is doubtful whether it is wise to insist absolutely on uniform standards for all. Recipes can not be used as exact guides as long as the composition of ingredients is variable, and people differ in their tastes.

Correlation.—A good scheme for correlation used by a San Francisco school is as follows: Each teacher outlines her work in advance in general terms for each quarter, and more in detail for each month and week. These outlines are discussed in faculty meetings, each teacher stating the point at which she would like help from the others. As a result of these discussions other points of correlation are seen.

The practical outcome of these discussions is seen by an examination of the chart used by these teachers. There are as many columns

in each direction as there are courses for the given year. In each square there is a hook upon which a library card can be hung. In the top square of her column the teacher places on a yellow card her monthly outline, and each week a pink card containing a more detailed outline of that week's work. When a teacher wishes correlative work from another department she writes her request on a white card which she hangs in her column, and in the square corresponding to the department from which the work is desired.

	Home economics.	History.	English.	Mathematics.	Science.
	(Place monthly and weekly outlines here.)				
Home economics.			English makes request of home economics.		
History.	Home economics makes request of history.				
English.					
Mathematics.					
Science.					

The above chart is supposed to be divided into squares.

In this way we may find across the top of such a board an outline of the work in each subject, while the up-and-down columns show at a glance what the various departments are expecting of each other during the current week. When the work is planned sufficiently in advance there is no difficulty in preventing conflicts.

LABORATORY EQUIPMENT.

Food work.—Individual equipment of table, stove, and utensils is desirable. However, when expenses must be kept down, a minimum equipment may be secured for $50, consisting of 12 individual sets of utensils, each costing about $2, and general equipment costing $25, including one three-burner oil stove and a supply table; for cooking tables whatever is available must be utilized.

Special cooking tables allowing working space of about 3 by $2\frac{1}{2}$ feet can be built in or purchased ready-made. They should provide storage room for utensils and food supplies underneath. Individual gas plates or stoves are desirable. If there is no gas, individual oil stoves are preferable, since gas-manufacturing plants, like acetylene, are not common in the home.

Cupboards, a fireless cooker, a refrigerator, and a wheeled supply table with shelves below for food materials are desirable. If possible, a dining room, or at least space for a dining table, should be arranged to afford practice in table service. The cost of china, silver, glass, and linen may be estimated at $62. Schools planning cooking equipment should send for catalogue to any large wholesale hardware company.

Sewing.—A sewing room should have tables 3 feet wide, allowing 2½ feet in length for each student. The general equipment should include sewing machines, dress forms, mirror, fitting stand, skirt marker, cabinets; and the individual equipment, scissors, yardstick, foot rule, tape measure, pincushion, emery, pins, and needles. Equipment cost about $1 per pupil in addition to general equipment.

OUTLINE OF LESSONS.

The following order has been used for each lesson: (1) The subject, stated as a "Problem." (2) The chief ideas, listed as "Points to be brought out." (3) The references, which have been confined to material available in bulletins of this department and of the various State colleges and experiment stations. Two textbooks should be obtained, one on foods and one on clothing. The choice of these must be left to the teacher. She should select them only after a careful examination of those available. The one on foods should be something more than a book of recipes; it should consider the principles of cookery, composition of food, and the principles of dietetics. The book on clothing should contain material on the selection of clothing, clothing standards, application of design to dress, the hygiene of dress, and a study of fabrics as well as drafting and the principles of sewing. If any part must be omitted let it be the latter, for the teacher can easily provide herself with a textbook on drafting and sewing so as to give the students the necessary information.

There should be in the library some additional books dealing with the composition, nutritive value, and digestibility of food. A good recipe book will be useful not for arbitrary use but for suggestions and comparison. It should not be misused. A good book on home laundry work, one on house sanitation, one on the care of the house, one on personal hygiene should be available for reference work. Copies of a good household chemistry, household bacteriology, and household physics will be found useful.

There are a number of such books [1] available at the present time. For a teacher of home economics to keep up to date in her work she must see the new books as they are published. Most publishers will send copies for examination which can be returned without cost to the teacher if they prove unsuitable for her purpose.

Bulletins are issued frequently which will be of help. These can in many cases be obtained free. The teacher's name should be on the mailing list of the Department of Agriculture for the Monthly List of Department Publications. She may send for any which interest her.

(4) Under "Correlation" are suggested ways in which other courses may make use of home-economics subject matter, thus in-

[1] See U. S. Bur. Ed. Bul. 613 (1914).

creasing the value of the latter and doing much to keep the former vital. Under "Supplementary Topics" are mentioned topics of household concern not directly related to the home-economics lesson of the day, but which may well be included in English work.

Each year's course consists of 160 lessons covering the subjects of cooking and sewing, with related hygiene and sanitation, and with review lessons at proper intervals.

LESSONS FOR FIRST YEAR'S COURSE.

LESSON 1.

Problem.—To plan, select the material, and estimate the amount of material necessary for (1) a dish towel, (2) a holder, and (3) a kitchen apron.

Points to be brought out.—Towels should be of as inexpensive material as possible, should absorb water readily, and should leave no lint. Holders should be constructed of material which does not burn readily and which is a poor conductor of heat. Aprons should be white, easily laundered, of simple design, and easily made.

References.—Write to State leader of girls' clubs for design of apron used in canning clubs.

Correlation.—Physics: Study conduction of heat (in connection with the selection of the material for the holder).

LESSON 2.

Problem.—To make the towel, holder, and apron.

Points to be brought out.—Making a neat machine hem on both straight and curved edges. Sewing on tapes. Overhanding or binding of the different layers of the holder together.

References.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2.

Correlation.—Arithmetic or English: Estimate the cost. Physics: Capillarity of woven fabrics.

LESSON 3.

Problem.—To can any fruit in season. To examine the stove and learn to understand all drafts and openings.

Points to be brought out.—In canning we wish to preserve the fruit in as nearly the natural condition as possible or in the condition in which we would serve it. Cooking in the can or jar is the easiest and the simplest method. Sugar is not used as a preservative in this case, but should be used in amounts just sufficient for good flavor. The essential points in the management of the stoves should be brought out during this lesson.

References.—U. S. Dept. Agr., Farmers' Buls. 426,* 521, and 771.

Correlation.—Physics: Study of conduction, convection, and radiation of heat, as applied in the stove. The insulated oven. The fireless cooker.

NOTE.—If possible plan an additional lesson on the canning of fruit in which one of the outdoor canners is used in the orchard. In this case can in tin. Show how the culls, which would in many cases be wasted, may be utilized. This work could be given with all the girls in places where large amounts of fruit are available. There might be a contest between the different classes. Aim to emphasize the economic side and at the same time give the girls opportunity to work with large quantities of material. This lesson may be substituted for one of the following lessons or given as an extra lesson on the weekly holiday.

LESSON 4.

Problem.—To study the relation of microorganisms to the spoiling of food.

Points to be brought out.—Since microorganisms which may cause the spoiling of food are present all about us extreme care is necessary to prevent the contamination of food. In preserving we must kill all the microorganisms present or prevent their development. Simple heating at the boiling point for 15 to 20 minutes is sufficient in the case of fruit. Most vegetables are more difficult to sterilize. They must be heated for several hours. A shorter time may be used at a much higher temperature such as is obtained under pressure, or the material may be heated for a shorter time on three successive days.

References.—Preservation of Food in the Home, Univ. Mo. Bul., 15 (1914), No. 7, pp. 1–8; U. S. Dept. Agr., Farmers' Buls. 359, 426,* and 521.

Correlation.—English: Stories of germ life.

LESSON 5.

Problem.—To can any available vegetables, using the following methods: (1) Cooking on each of three successive days, (2) long cooking at the boiling temperature, and (3) cooking under pressure, if possible. Compare the methods as to time and trouble involved, the keeping qualities of the products, and the amount of fuel required.

Points to be brought out.—Complete sterilization is more difficult in the case of vegetables than in the case of fruits. The comparative value of the different methods of canning. The canned vegetables are an important addition to the winter's dietary.

References.—U. S. Dept. Agr., Farmers' Buls. 259*,[1] pp. 30–32; 359.

Correlation.—Arithmetic: Estimate cost of home-canned vegetables, taking into consideration the different factors involved. Compare with the cost of the factory-canned material. English: History of canning industry (Encyclopedia).

[1] Farmers' Bulletins marked with an asterisk throughout this publication are not available for free distribution, but may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents a copy.

LESSON 6.

Problem.—Canning vegetables, continued. Use any vegetables available.

Correlation.—English: Select from lists of U. S. Department of Agriculture a Farmers' Bulletin on some aspect of vegetable foods or cookery which would be useful in your home, and write to the Secretary of Agriculture, Washington, D. C., for it.

LESSON 7.

Problem.—To launder kitchen towels and aprons.

Points to be brought out.—The soil and dirt may be removed by solution, emulsion, and mechanical means; soaking helps to loosen them. Clothes should be thoroughly rinsed in order to remove the last traces of any material in solution, as well as the soluble cleansing agent.

References.—Rose, The Laundry, Cornell Univ. Reading Courses, 1 (1912), No. 11, pp. 133–136; Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2.

Correlation.—Chemistry: Soaps. English: Soap-making (Encyclopedia).

LESSON 8.

Problem.—To prepare fruit juices, some to be used the next day for making jelly, and the remainder to be sterilized and kept for winter.

Points to be brought out.—When the juice is to be used in making jelly the fruit must be cooked in order to extract the pectin, which is an essential constituent of jelly. The juice to be used in jelly making may be allowed to drip or may be extracted by pressure; the former method makes a clearer jelly, but often at the expense of flavor and quantity. The juices to be used for purposes other than jelly making preserve more of the natural flavor if extracted cold and sterilized at the lowest possible temperature.

References.—Univ. Ill. Bul. 8 (1911), No. 7, Goldthwaite; Preservation of Food in the Home, Univ. Mo. Bul., 15 (1914), No. 7, pp. 21, 22; U. S. Dept. Agr. Farmers' Buls. 78*, p. 29; 122*, p. 27; 175*; 644.

Correlation.—Arithmetic: Comparative cost of clear and cloudy jelly.

LESSON 9.

Problem.—To make jelly from some of the juice prepared in Lesson 8.

Points to be brought out.—Three constituents are necessary for successful jelly making—acid, pectin, and sugar. The amount of sugar added depends not so much upon the amount of juice as upon the amount of pectin in that juice. The usual proportion of sugar, one cup to each cup of juice, is too much in the case of a juice in

which the amount of pectin is small or in the case of a fruit in which large amounts of water are necessary for the extraction. It should be cooked until it jells. This point has been reached when a thermometer inserted in the solution indicates a boiling point of 103° C. (217° F.). In a few cases it is necessary to cook the juice to a higher temperature, 105° C. (218° F.).

References.—Univ. Ill. Bul., 8 (1911), No. 7, Goldthwaite; Preservation of Food in the Home, Univ. Mo. Bul., 15 (1914), No. 7, pp. 23–29.

Correlation.—Physics: The effect of substances in solution upon the boiling point of that solution. Arithmetic: Explain the different thermometers, Fahrenheit and Centigrade, and compute changes of readings from one to the other.

LESSON 10.

Problem.—Examination of the jellies made last time, an analysis of the process, and a discussion of the reasons for any variations in the results.

Points to be brought out.—Failure may be due to (1) absence of pectin in the juice. This can be determined by the alcohol test. (Ref. Univ. Mo. Bul., 15 (1914), No. 7, Preservation of Food in the Home, p. 23); (2) a deficiency of acid which prevents a perfect jelly from forming. Sugar sometimes crystallizes out from a jelly made from juice containing a small proportion of acid. If cooked too long, a candy rather than a jelly will result.

References.—U. S. Dept. Agr., Farmers' Buls. 78*, 122*, 175*.

Correlation.—Chemistry: Result obtained by boiling cane sugar in an acid solution, and the effect of this in retarding crystallization.

LESSON 11.

Problem.—To study the water supply from the standpoint of its use for laundry purposes. Wash the laboratory aprons and towels in water from different sources and compare the ease of the process, the amount of soap required, and the appearance of the article after laundering. In case the water is very hard, test the effectiveness of various alkalis in softening it. Show how to detect an alkali.

Points to be brought out.—Hardness of water is due to the mineral matter in solution. Some of this is thrown out of solution when the water is boiled. Hardness of water which may be corrected by boiling is termed temporary hardness. That which is not remedied by boiling is called permanent hardness. Soap does not dissolve readily in hard water because it forms an insoluble compound with the mineral matter present. The scum which forms on the top of hard water when we use soap with it is an example of such an insoluble

compound. Alkalis soften water by throwing the mineral compounds out of solution. Care must be taken to avoid using an alkali which will harm the material to be washed.

References.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11, pp. 114–117; Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, p. 82; any good book on home laundry work.

Correlation.—Chemistry: Alkalis and the means of detecting them.

Supplementary topic.—Describe the water supplies on your homestead, and suggest ways of making the water supply more convenient at the house.

LESSON 12.

Problem.—To recook any jelly which was found unsatisfactory at the last lesson.

Points to be brought out.—If an examination of the juice shows too little pectin, add some from another source, such as apple or white rind of the orange or lemon. If the juice is not sufficiently acid, add an acid from another source, lemon juice or citric acid. In case the proper amount of sugar has not been used, make the necessary correction. In some cases a soft jelly may be stiffened by allowing it to stand for a short time in the sun.

References.—Univ. Ill. Bul., 8 (1911), No. 7, Goldthwaite; Preservation of Food in the Home, Univ. Mo. Bul., 15 (1914), No. 7, Covering with paraffin; U. S. Dept. Agr., Farmers' Buls. 78*, p. 29; 122*, p. 27; 175*.

Correlation.—Arithmetic: Estimation of the cost of the jelly. Comparison in cost with the commercial product.

Supplementary topic.—List the kinds of fruits you know which will and which will not jelly. Ascertain the localities in the United States in which fruit raising is an important industry.

LESSON 13.

Problem.—Let each student clean her room and write an account of the process, giving the reason for each step. Discuss these accounts in class and make a plan to be followed by each of the girls in the care of her room.

Points to be brought out.—Thorough airing of bed and room is necessary. In cleaning care should be taken not to distribute dust. In dusting it is best to work downward from the upper part of the room.

References.—Watson, Rules for Cleaning, Cornell Reading Courses, 1 (1912), No. 23; a good book on the care of the house.

Correlation.—Arithmetic or English: Time and energy cost of cleaning rooms. Cost of equipment and supplies used.

LESSON 14.

Problem.—To make marmalade.

Points to be brought out.—In a marmalade, although the fruit is much more finely divided than in the case of preserves, the fruit and juice should remain distinct.

Reference.—U. S. Dept. Agr., Farmers' Bul. 203.

Correlation.—Arithmetic: Compare the cost of marmalade and jelly.

Supplementary topic.—Discuss a plan for improving the quality of homemade preserves, etc., in a community by means of local institute or school of domestic science for farm women.

LESSON 15.

Problem.—To plan a cap and an apron to be worn during the daily cleaning of the rooms.

Points to be brought out.—The purpose of the cap is to protect the hair from dust. It can do this and at the same time be attractive. The design should be such as will admit of easy laundering. Let the students bring in designs to be discussed and from them make the selections. (The choice of the design will depend somewhat upon the experience of the class in sewing. In general, the simpler the better.) The apron should cover the dress completely. The bungalow apron now so much used is of good design, is easily made, and will serve to introduce the later work on a gown. (See Lesson 78.) It is not necessary to buy a pattern for this apron, since the design is very simple. The apron should be made of gingham in attractive colors, with the cap to match. Emphasize especially the desirability of a neat and attractive appearance while at daily work and the suitability of specially planned work clothing, rather than soiled, cast-off finery.

References.—Any current pattern book.

Correlation.—Arithmetic: Estimate the cost of cap and apron. Compare them with the cost of ready-made caps and aprons as priced in stores and mail-order catalogues.

Supplementary topic.—Outline a plan for the purchase by a group of 10 neighbors of a vacuum cleaner and gasoline engine to run it, each person to have it for a day twice a month; estimate costs, suggest rules for use, repair, transportation, etc.

LESSON 16.

Problem.—To wash with different kinds of soap in order to compare their cleansing action, their effect on the color and appearance of the garment, and their lasting quality. To test soaps for free alkali.

Points to be brought out.—Soap cleans by its emulsifying and dissolving action. Study the different soaps and washing powders available and classify them according to their uses.

References.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11, p. 117; any household chemistry.

Correlation.—English: The relative economy of the use of different soaps and washing powders. Discuss ways of reducing the amount of mud tracked into farm houses,including changes outside and inside (as walks and doormats), personal habits necessary, etc.

LESSON 17.

Problem.—To make preserves, jams, and butters. The points of difference and the means of producing the different types.

Points to be brought out.—There is a definite standard for each of the above products. By controlling the conditions under which the different fruit products are made we determine which of the products shall result.

References.—U. S. Dept. Agr., Farmers' Bul. 203.

Correlation.—Agriculture or Nature Study: The fruits available in your community; best varieties. What new varieties might well be introduced into your community or on your homestead?

LESSON 18.

Problem.—Cut out and baste a dust cap and apron.

Points to be brought out.—The material should be carefully cut with long strokes of the scissors. The work is neater when the parts which are likely to slip have been carefully basted. We should not, however, baste unnecessarily.

References.—Directions sent out by leaders of canning clubs. Any good book on sewing.

Correlation.—English: Write a description of cap and apron and tell how they are made.

LESSON 19.

Problem.—To discover the effect of soaking cucumbers in brine. Weigh the cucumbers, place them in the brine, weigh them every day for several days, and note their loss of weight and the change in their appearance. Put into brine the material for the pickles to be made in the later lessons.

Points to be brought out.—Salt, and sometimes sugar, may be used to draw the surplus water from fruits and vegetables which we wish to preserve by the use of sugar, spice, and vinegar. When the material is finely divided, the water may be extracted by mechanical pressure. This is a good time to show the effect of the very common practice of soaking the fresh sliced cucumbers in salt water before serving. The salt draws the water from the cucumbers, toughening them and rendering them less rather than more digestible.

References.—U. S. Dept. Agr., Farmers' Bul. 521; Office Expt. Stas. Bul. 245, pp. 87–90.

Correlations.—Botany: Osmosis in relation to vegetable cells. Agriculture: The varieties of cucumbers and their culture.

LESSON 20.

NOTE.—A series of lessons on mending has been planned, the object of which is not only to teach the girls how to mend but to give them definite standards for the care of their clothes and to develop in them the habit of keeping their clothes in order. It therefore seemed desirable to distribute the lessons over the school year rather than to have them all together. An attempt has been made in these lessons to include all the types of mending which the girls will find useful and to introduce them in the order in which they seem most likely to arise. The girls should, if possible, at each of these lessons bring in any clothing that needs attention. According to the discretion of the teacher instruction may be given to the girls individually, or the individual needs may be made the basis of a class discussion.

Problem.—To outline the essential points in the daily care of clothing, with demonstrations, as of brushing, folding, etc. To darn stockings.

Points to be brought out.—Putting clothing away carefully does much to preserve its appearance. Neatness is essential. Frequent brushing and pressing do much to prolong the life of clothes.

Reference.—Textbook on clothing.

Correlations.—English: Write a story proving that a stitch in time saves nine. Arithmetic: Estimate costs, including the factor of time, of mending your own clothing, and the clothing of a family of six.

LESSON 21.

Problem.—To make soap, using, if possible, alkali leached from wood ashes.

Points to be brought out.—Soap is made from a combination of lye with fat. When these are combined in the correct proportions, the reaction of the soap is neither acid nor alkaline.

References.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11. Ask the mothers.

Correlation.—Arithmetic and English: Calculate the time necessary to make soap and the cost. Is the factory product cheaper? What is "chip soap"? Make a drawing of a pump or water pipe, with a flexible hose to fill the tubs; also of a stopcock at bottom of tub to empty it. Describe.

LESSON 22.

Problem.—To remove the vegetables from brine and start making the pickles.

Points to be brought out.—The liquid in which the pickle is preserved is intended both to prevent decay and to give flavor. Unless the vegetable material is finely divided it must be heated in order to have the liquid penetrate. Finely divided pickles may be preserved raw if the pickling solution has sufficient antiseptic power.

Reference.—Same as in Lesson 19.

Correlation.—Arithmetic: Calculate the cost of the pickle.

Supplementary topics.—List the seasonal work in a household—i. e., tasks in addition to daily and weekly routine; for which should men of household help or hired help be secured? How many hours a day is it wise to work, thinking of a well-balanced life?

LESSON 23.

Problem.—To clean and care for a sewing machine.

NOTE.—This lesson is introduced at this point, as the machines have not been needed to any considerable extent up to this time. The first few lessons have served to introduce some of the problems involved in its use. The teacher should demonstrate carefully the cleaning and oiling of the machine and the essential points in changing the tension, etc. Each girl should have charge of a machine for a stated time.

Reference.—Book of instructions with machine.

Correlation.—English: Write a set of rules for the routine care of a machine. Costs of various machines (get catalogues). Can a gasoline engine be arranged to run the sewing machine? Make a drawing to show how.

LESSON 24.

Problem.—To finish the pickles.

Points to be brought out.—It is necessary to have every bit of pickle completely covered by the preserving fluid.

References.—U. S. Dept. Agr., Farmers' Bul. 521; Office Expt. Stas. Bul. 245, pp. 87–90.

Correlation.—English: Compare cost of factory and homemade pickle. What light does this throw on value of woman's home work?

LESSON 25.

Problem.—To score all food products preserved so far. Study the preserve closet. Prepare for a demonstration and exhibit for the neighboring women, to be held on a Saturday.

Points to be brought out.—There are definite standards to which these different food products should conform. The preserve closet should be kept in order and should be so arranged that all its contents are accessible.

Reference.—Univ. Mo. Bul., 15 (1914), No. 7, The Preservation of Food in the Home.

Correlation.—English: Draw a plan and make out specifications for a preserve closet; give reasons for its distinctive features.

LESSON 26.

Problem.—To work on apron and cap.

Supplementary topic.—Explain the relation of a public library to the home life of its patrons. What does it do for them? Can loans of books be secured by your community from your State, county, or other library?

LESSON 27.

General review.

LESSON 28.

Problem.—To finish apron and cap.

Supplementary topics.—How might six neighbors organize a magazine club, each subscribing for one magazine and exchanging, so as each to get the use of all six? Draw up plan, list of magazines, costs, rules for ordering, for exchange, etc.

LESSON 29.

Problem.—To sterilize petri dishes and plate. Pour tubes of agar into petri dishes for experiments in the next lesson.

NOTE.—The tubes of agar should be prepared by the teacher or an advanced class.

Points to be brought out.—For any material to remain aseptically clean it must not be touched by anything which has not been sterilized.

Reference.—Any good bacteriology of the household.

LESSON 30.

Problem.—The weekly care of the bedroom. On the day usually devoted to this work the room should be carefully cleaned and an account written of the various steps, with the reasons for them. The following experiments with the petri dishes are suggested to make the reasons for the various steps in the cleaning process more clear: Expose 12 petri dishes as follows: (1) Immediately after sweeping a carpet, (2) immediately after sweeping a bare floor, (3) one-half hour after sweeping, (4) one hour after sweeping, (5) one and one-half hours after sweeping, (6) two hours after sweeping, (7) after dusting with a feather duster, (8) after dusting with a dry cloth, (9) after dusting with an oiled cloth, (10) after making a feather bed, (11) after brushing a skirt in the room, and (12) after brushing shoes in the room.

NOTE.—The purpose of these lessons is to give directions for the care of the room. Stress just those points which seem to be most needed by the different girls. These experiments can be outlined on any convenient day and the plates exposed whenever the rooms are cleaned.

Points to be brought out.—A bare floor is more sanitary than a carpeted one. In sweeping we should aim to collect and remove dust, not to scatter it. A sufficient time should be allowed after sweeping to insure the settling of the dust. An oiled cloth is best for collecting dust. Making a bed, brushing a skirt, and brushing shoes all serve to distribute dust and bacteria in the room.

Reference.—Watson, Rules for Cleaning, Cornell Reading Courses, 1 (1912), No. 23.

Correlation.—English: Write an account of the ways that girls pollute the air of their rooms unnecessarily. Make constructive recommendations.

LESSON 31.

Problem.—To prepare oil dusters and equip a cleaning closet There should, if possible, be a cleaning closet accessible to the girls on each floor of the dormitory or of the home. If this is already equipped, the equipment should be carefully gone over and put in order. The girls should be responsible for seeing that it is kept in order. This furnishes a splendid opportunity for the study of equipment for cleaning.

Points to be brought out.—Time is saved in cleaning and the work is better done if good apparatus is provided. A cleaning closet is desirable for then we know where to find our cleaning appliances.

Reference.—Watson, Rules for Cleaning, Cornell Reading Courses, 1 (1912), No. 23.

Correlation.—English: Write a description of and estimate the cost of equipping a cleaning closet. List costs of improved cleaning appliances—dustless dusters, carpet sweepers, and hand vacuum cleaners. Would the gasoline engine used on milk separator and washing machine run a vacuum cleaner? How? (Get catalogues and prices.)

LESSON 32.

Problem.—To make vinegar.

Points to be brought out.—Microorganisms are not always harmful in the household. By controlling them properly we may make them useful. We may use them in the making of vinegar.

References.—U. S. Dept. Agr., Farmers' Buls. 233*, p. 28; 276*, p. 28.

Supplementary topic.—English: Beekeeping, a vocation for farm women. (Secure Farmers' Bulletins, catalogues.)

LESSON 33.

Problem.—A summary of the uses to which we may put microorganisms in the home.

Points to be brought out.—The importance of microorganisms in the ripening of cream and cheese, and in bread making.

Excursion.—Visit the school dairy or a near-by creamery and see how the milk is ripened with a starter, and, if possible, watch the process of cheese making.

Correlation.—English: Write an account of the excursion.

Supplementary topic.—Methods of organizing cooperative creameries. What household work might be handled cooperatively? Could washing? (See Journal of Home Economics.)

LESSON 34.

Problem.—Make short-process bread, using compressed yeast if available. If there is a bakery in the vicinity the yeast can usually be procured there, which grows very rapidly when the yeast is fresh.

Points to be brought out.—The time required in making the bread, other conditions being the same, is directly dependent upon the amount of yeast used.

Reference.—U. S. Dept. Agr., Farmers' Bul. 807. Textbook on foods.

Supplementary topic.—Essay on the Baking Industry in your home community in its relation to your home. What does it do, what might it do, for your home?

LESSON 35.

Problem.—Examination of the petri dishes exposed in the lesson on cleaning (p. 18). So far as possible, distinguish between the bacteria and yeast on the one hand and the molds on the other.

Points to be brought out.—The plates exposed at different lengths of time after sweeping show that the microorganisms have not completely settled until about two hours after sweeping. There is danger of distributing disease germs when we brush shoes and skirts in the room.

Reference.—Any book describing bacteria, yeasts, and molds.

Supplementary topic.—English: Describe the arrangements which you would suggest, in an ideal household, for cleaning shoes and clothing.

LESSON 36.

Problem.—To wash the individual towels from the bathroom. List the processes involved.

Points to be brought out.—Boiling is valuable as a means of cleansing and as a means of disinfection. It is possible to transmit disease by means of garments, towels, etc. Fresh air and sunlight are valuable disinfectants. Bluing is used to neutralize the slight yellow color which comes as the natural result of the action of hot water and alkali on the textile fabrics. Only a slight amount is necessary for this. More is used to cover up careless work and gives a dirty, dingy, blue color to the clothing. Kinds of bluing: (1) Indigo—little used; (2) Prussian blue, an iron compound, frequently causes iron rust stains; (3) ultramarine blue, a mineral compound, used in suspension; and (4) aniline blue, a coal-tar product, the cheapest and most common type of bluing. Test and identify the bluings ordinarily used.

References.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11. Any good book on home laundry work.

Correlation.—Chemistry: Methods of identifying the different bluings.

LESSON 37.

Problem.—To make short-process bread into coffee cake, cinnamon rolls, Swedish tea rolls, Sally Lunn, etc.

Points to be brought out.—Necessity for practice in handling the dough and managing it so as to promote the growth of the yeast.

Short-process bread is usually lacking in flavor and a little cinnamon and sugar will conceal the absence.

Reference.—Any good book on food preparation.

Correlation.—English: Write a description of how each of the above products should be made.

LESSON 38.

Problem.—Study of yeasts and conditions under which they live best. Study the forms in which they may be obtained. Start sponge from yeast foam.

Reference.—U. S. Dept. Agr., Farmers' Bul. 807.

Correlation.—English: Write a story of a cake of yeast.

LESSON 39.

Problem.—To make bread, using sponge from the dried yeast, the so-called yeast foam. Use bread mixer.

Points to be brought out.—In the dried yeast cake the yeast is in a dormant state. It must have time to get started, therefore we soften the cake with luke-warm water and let it grow in the sponge. Dried yeast is used almost exclusively in the country because it does not deteriorate rapidly. The bread should be formed into loaves which are not too large to permit of proper baking.

Reference.—Textbook on food.

NOTE.—Do not let the students get the idea that compressed yeast can not be used in making long-process bread.

Correlation.—English: Describe the different kinds of yeast available, with prices.

LESSON 40.

Problem.—To score bread and review all the steps involved in its making.

Points to be brought out.—If good bakery bread may be obtained it is sometimes uneconomical to make bread at home. The cost of fuel and the value of the worker's time must be taken into consideration.

Reference.—Any good book on food preparation.

Correlation.—Arithmetic: Compare the cost of homemade and baker's bread.

LESSON 41.

Problem.—To inspect kitchen linen and make additional towels, if any are necessary.

Points to be brought out.—There should be an adequate supply of dish towels and cloths. Both should be neatly hemmed. The best materials are those which absorb water easily and leave no lint.

Correlation.—Arithmetic: Determine the amount of kitchen linen necessary for a family of six and estimate the cost.

LESSON 42.

Problem.—To grow yeast.

Points to be brought out.—Yeasts are grown, not made.

References.—Any old-fashioned recipe book. Ask mothers for method they have used.

Supplementary topic.—Discuss possible ways of shortening the work-day of the farmer's wife. Is it longer than the man's day? Will shortening his help hers?

LESSON 43.

Problem.—To make bread from yeast grown in different ways and to compare the resulting flavors. Start sponge for the salt-rising bread. (See next lesson.)

Points to be brought out.—The yeasts grown in the different ways may affect the flavor of the bread through some constituent which in itself may change the flavor, or through the retarding action of some one constituent on some of the microorganisms which may enter the brew. The sponge must contain an abundance of carbohydrate material, part of which is in soluble form, and sufficient nutritive material for the growth of the yeast. Hops are added as an antiseptic.

Correlation.—English: The yeast industry, the wheat belt, the flour industry.

LESSON 44.

Problem.—To make salt-rising bread.

Points to be brought out.—Bacteria may be used as well as yeast in the production of gas to make bread light. Cornmeal is used in the household as a source of these organisms when we make salt-rising bread. We always find in conjunction with them certain other organisms which give the typical flavor to the bread. Salt is used in this bread to prevent the growth of some undesirable organisms. Milk is essential as food for the bacteria. They grow best at a higher temperature than yeast. This bread has a distinct flavor very much liked by some.

Suggestion.—This can be made into a loaf or served hot in the form of rolls. It is especially desirable for toast. Baking it in small baking powder tins gives the whole loaf a brown crust and insures round, well-shaped slices.

Supplementary topic.—Breads of different lands. Stoves of different lands.

LESSON 45.

Problem.—To finish the work with the kitchen linen. It should all be marked and put away in an orderly manner. The first-year students may have the task of keeping the kitchen linen in order for the year.

Points to be brought out.—Linen should be carefully marked and the date of its acquisition added so that we may know how long the dif-

ferent kinds wear. A linen closet should be planned so that the different kinds of linen can be kept separate and a person can tell at a glance just what is lacking.

LESSON 46.

Problem.—How to keep well.

Points to be brought out.—*Health* is that condition of the body and its organs necessary to the proper performance of their normal functions. *Disease* is a pathological or abnormal physiologic state. *Kinds of disease:* (1) Autogenic, those which arise in the body—indigestion, rheumatism, gout, nervousness, etc.; (2) contagious, those which are due to micro-organisms coming from the outside. *Prophylaxis* is the use of hygienic or other precautions for the prevention of disease. It may consist of (*a*) disinfection, (*b*) keeping the body in healthful condition so that it may resist the attacks of disease-producing microorganisms. *Means of keeping well and strong:* (1) Eating proper food in proper amounts, (2) getting sufficient fresh air and exercise, and (3) maintaining cleanliness inside the body and outside. It is our duty to keep well. We become ill when we disobey the laws of nature.

Reference.—Any good book on personal hygiene.

Supplementary topic.—Estimate in dollars and cents the cost to the family of the illness of some person whom you know. How is sickness a cost to the community? What does your community do to protect its members against sickness?

LESSON 47.

Problem.—General summary and review of bread.

LESSON 48.

Problem.—The relation of food to health.

Points to be brought out.—Food is probably the most important factor in the question of health. We should have it in proper kind and amount. Meals should be properly distributed throughout the day. The dangers from eating between meals are due to lack of sufficient intervals of rest for the stomach and also to the fact that food taken in this way is likely to take away the appetite for the regular meals. Girls who indulge in candy and sundaes between meals are liable to be undernourished. We need to study the food question carefully not only because certain autogenic diseases are the direct result of improper food, but because improper food lowers the body resistance and makes us more susceptible to contagious diseases. One of the best means of preserving health is the right choice of food.

Reference.—Any good book on food and nutrition.

Correlation.—Chemistry: Compare the composition of the body with that of some typical foods.

Supplementary topic.—What books on food should a housewife have? Plan the entire library of an ideal farmer's family. What general subjects would be included in such a library?

LESSON 49.

Problem.—To bake apples and to cook cranberries.

Points to be brought out.—Apples cook more quickly with the skins on and the cores removed. Water is unnecessary in most cases. The skin keeps in the steam and the volatile flavors. Apples which have been pared and cooked without any water in the fireless cooker approximate baked apples in flavor. In cooking cranberries we add the sugar at the beginning of the operation if we wish the berries to hold their shape, at the end if we wish to make a sauce of them. Fruits are very valuable in the daily dietary, because they furnish mineral matters and mild acids, and should appear in some form other than rich preserves at least once daily.

Reference.—U. S. Dept. Agr., Farmers' Bul. 293.

Correlation.—Chemistry: Make a list of some of the chemical elements which are important constituents of fruits and list the fruits in which they are present in the largest amounts. English: List and discuss varieties of apples available in your community. What kinds would you like on your farm?

LESSON 50.

Problem.—To study the relation of fresh air and exercise to health.

Points to be brought out.—Stress the value of fresh air and exercise. Night air is not harmful. It has been proved that outdoor sleeping even in cold climates increases the resistance to disease and renders one less susceptible to colds.

Reference.—Book on personal hygiene.

Correlation.—Physical training: Make out a weekly schedule which will furnish exercise of the proper type in the required amount; mention outdoor fun which a neighborhood group or a family group can occasionally enjoy together.

LESSON 51.

Problem.—To study the relation of personal cleanliness to health; toilet soaps.

Points to be brought out.—Personal cleanliness is necessary for the best health. It includes daily bath to remove perspiration, oil, etc., from the skin; care of teeth; care of hair; sufficient changing of clothing; and keeping the digestive tract clean. Constipation is the root of many ills. The purpose of the daily bath is to keep clean, not to get clean. The bath furnishes exercises to the skin. If one can stand the

effect of a cold plunge, it decreases considerably the tendency to catch cold. Toilet soaps should never contain a large excess of alkali. They should be made of pure fat. Perfume is frequently used to hide poor materials in soap making. The amount of water present in the soap determines the hardness of the latter. Since the way in which soap "spends" depends upon this hardness, it is wise to let the cake stand exposed to air for a while before using it.

References.—Books on personal hygiene and household chemistry.

Correlation.—English: Outline ways in which running water can be put into a detached farmhouse; a shower bath improvised. Determine the difference in the time a soft cake of soap lasts compared with a hard cake of the same kind.

LESSON 52.

Problem.—To cook dried fruit.

Points to be brought out.—Slow cooking helps to soften dried fruit and makes it absorb more completely the water lost in drying. Soaking is valuable as a means of decreasing the length of time necessary for cooking.

References.—Langworthy: Raisins, Figs, and Other Dried Fruits, and Their Use, U. S. Dept. Agr. Yearbook Separate 610; Farmers' Bul. 771.

Correlation.—Arithmetic: Determine the percentage of water absorbed in cooking soaked and unsoaked dried fruit. Compare the composition of cooked dried fruit with fresh fruit.

Supplementary topic.—List the kinds of dry fruit available, with prices. (Stores and catalogues.)

LESSON 53.

Problem.—Food as building material.

Points to be brought out.—Food does two things in the body—it furnishes energy and it furnishes the material from which the body fluids and tissues are formed. About 6 per cent of the body is made up of mineral material, and unless this is supplied in the food we soon see the effects of such a deficiency. It is ordinarily conceded that sufficient mineral matter is present in the diet as usually selected. This is true only if we select our foods wisely and prepare them so as to retain as much as possible of this mineral material.

References.—U. S. Dept. Agr., Office Expt. Stas. Buls. 185 and 227.

Correlation.—Chemistry: List the elements present in the body. Divide them into two groups, acidic and basic.

LESSON 54.

Problem.—To prepare mashed potatoes. These should be cooked in different ways—baked, boiled with the skin on, boiled with the skin off, and boiled after being peeled and cut into cubes. Cream each,

adding the same proportion of seasoning in each case. Compare as to flavor. If time and the following vegetables are available, compare also the flavor of tomatoes baked in their skins with stewed tomatoes, and beets baked in a tightly covered casserole with beets boiled in the usual way. (Unless the beets are very tender, the addition of a very small amount of water may be necessary.)

Points to be brought out.—Many of the flavoring principles of vegetables are volatile and are soluble in hot water. In baking a large portion of the volatile flavor is held in by the skin. Only those vegetables which have a natural protective covering and contain sufficient water to hydrolyze the starch and cellulose present can be successfully baked without an artificial outside cover such as a casserole or a paper bag. A tight casserole is better than a bag, because the vegetable can be served in the dish in which it is prepared. When vegetables are boiled and the liquor is poured off some of the nutritive material and much of the mineral salts are lost.

References.—U. S. Dept. Agr., Farmers' Buls. 256 and 295; Office Expt. Stas. Buls. 43* and 45*.

Correlation.—Chemistry: Make lists of the vegetables in which given elements predominate.

Supplementary topic.—English: Describe the vegetables which you have eaten and the ways in which they were prepared. What vegetables would you like to add to your kitchen garden at home?

LESSON 55.

Problem.—Making a bed, its daily care, and a study of the essential bed clothing.

Points to be brought out.—The bed should be aired each day. The bedclothes next the sleeper should be frequently changed, since they are likely to be soiled from contact with the body. In no case should we use bed clothing next us which can not be frequently washed. Characteristics desirable in bed covers are warmth and lightness.

Reference.—Any good book on household management or care.

Correlation.—English: Make a list of the bed clothing desirable for a family of six and estimate the cost. Discuss metal bedsteads versus wood; different kinds of mattresses, bed springs. (Visit stores and consult catalogues.)

LESSON 56.

Problem.—To put clothing in order and pack it properly for the holiday trip home. Any suits or dresses to be taken should be carefully pressed.

Points to be brought out.—All garments should be examined to see that they are in perfect repair. Sew on any loose fastenings. In packing all garments should be carefully folded so as to make as few

wrinkles as possible. Rolls of tissue paper or soft garments are frequently put between the heavier folds to prevent deep creases. The secret of successful packing lies in careful folding and in packing tightly, also securing the clothing in some way so it will not slide about. Well-packed garments can be taken out unwrinkled and ready to wear. Spots on a skirt are usually caused by the accumulation of dust in grease. The grease may be removed by the action of a solvent or by absorption.

Correlation.—Chemistry: Test the solubility of fat.

LESSON 57.

Problem.—To prepare the strong-flavored vegetables—cabbage, turnips, and onions.

Points to be brought out.—Much of the objectionable flavor of some vegetables can be avoided by cooking in an open vessel. Have the same vegetables cooked with the cover of the vessel on and some with the cover off. Discard all the liquor from some, retain the liquor which is poured off from others, concentrate to reduce the bulk, and further volatilize the flavor and use with suitable seasoning to make a sauce for the vegetable. In all the lessons on vegetables have them well seasoned and attractively served. Emphasize the lack of fat in vegetables and the value of adding it as seasoning. In communities in which olive oil is used it gives a distinctive flavor which is very much liked. One of the charms of Italian and Grecian cooking comes from the use of olive oil. Well-made cottonseed oil is also good.

References.—U. S. Dept. Agr., Farmers' Bul. 256; Office Expt. Stas. Bul. 245.

Correlation.—English: Discuss canned versus fresh vegetables; the facilities and value of methods for the household storage of vegetables.

LESSON 58.

Problem.—To prepare vegetables suitable for the Thanksgiving dinner. In this lesson the aim is to give the girls some suggestions to carry home with them. As many different ways of preparing vegetables as possible should be tried. Each girl should try at least one while at home and report upon its success. We should try to honor the occasion by using vegetables in unusually attractive ways.

References.—U. S. Dept. Agr., Farmers' Bul. 256; Office Expt. Stas. Bul. 245; Bureau of Education, Manila, Bul. 35 (Supt. of Documents, Washington, D. C.). Any good recipe book, especially one compiled in the vicinity.

Correlation.—English: Essay: (1) The Holidays, Festivals, and Birthdays, etc., of an American family, with suggestions for observances. (2) What can the family do to develop in its members the religious spirit which is at the basis of Thanksgiving Day?

LESSON 59.

Problem.—To prepare some vegetable for the Thanksgiving dinner. This is to be done at home and a written report submitted at the next meeting of the class.

LESSON 60.

Problem.—To put away summer clothing. (To be done while at home and a written report handed to the teacher.)

Points to be brought out.—All should be cleaned and mended. All buttons should be in place. Cotton and linen garments should be put away without starch and rough dried; all others should be carefully pressed and folded, and as far as possible each garment should be ready to wear when taken out.

Reference.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2.

Correlation.—English: What magazine seems to you to have the best discussions of dress; why? What magazines would you suggest for a farmer's family composed of father, mother, boy of 16, girl of 12, boy of 10, assuming that they have $15 a year for magazines? Give reasons for your choice.

LESSON 61.

Problem.—Christmas sewing. Six lessons are given over to the Christmas sewing. No special outlines will be worked out for these lessons. The aim of these lessons should be to foster the true Christmas spirit and at the same time to furnish practice in some of the fancy stitches.

Points to be brought out.—In the making of Christmas gifts everything should be either useful or beautiful, wherever possible both. Emphasize especially the utility of the gift and it adaptation to the person for whom it is intended. Keep the expense down as much as possible. Teach the pupils to use the materials at hand and those which are available at slight expense.

Reference.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, pp. 21–29.

Supplementary topic.—Discuss principles underlying the exchange of gifts between members of a family.

LESSON 62.

Problem.—To analyze the successes and failures in preparation of vegetables at home and discuss the selection and care of vegetables.

Points to be brought out.—Fresh vegetables should be used as soon as possible after gathering since the flavor changes on standing. Crispness is a desirable characteristic. This crispness comes from the presence of water and is lost with evaporation.

References.—U. S. Dept. Agr., Farmers' Bul. 375, pp. 24–28, 31–34; Office Expt. Stas. Bul. 245, pp. 91–94.

LESSON 63.

General review.

LESSON 64.

Problem.—To make peanut brittle. It is better to make this by simply melting the sugar without the addition of water.

Points to be brought out.—Dry heat melts sugar, changing it first to a light brown sirup which hardens on cooling and is the basis of brittle candies. If the heating were carried further there would be a continued browning and the material called caramel would be formed. Water is given off during the process of melting.

Reference.—Any good book on food preparation or candy making.

Correlation.—Arithmetic: Calculate the cost of homemade peanut brittle and compare it with the price of that bought at the store.

LESSON 65.

Start Christmas sewing. (See Lesson 56.)

Supplementary topic.—Make a working plan for the control of money in the family. Should the father have sole control, or father and mother plan jointly for expenditures? At what age should children be told about family finances?

LESSON 66.

Christmas sewing. (See Lesson 56.)

Supplementary topic.—Many children are given a regular allowance of money for clothing, for savings, for gifts. Write a story of a girl's allowance and what she did with it. What are the advantages in having an allowance?

LESSON 67.

Problem.—To make fudge.

Points to be brought out.—In making fudge we dissolve the sugar and other materials in water and cook until a definite concentration is reached, then by beating we recrystallize the sugar, or, as we say, make it "cream." In these candies we wish the crystals to be very small, so small that they can not be felt separately on the tongue. We are able to do this partly on account of a change brought about in the sugar during the cooking process, and partly by controlling the conditions under which the crystallization has taken place. The cooking changes are hastened by the addition of a weak acid. If too much acid is added the change goes too far and the candy will not cream at all. Does chocolate contain any acid? Brown sugar and sirups contain in varying amounts the same material to which sugar is changed on cooking, so when they are used acid is unnecessary. We control the crystallization by beating only after completely cold, not stirring unnecessarily while cooking, and by keeping the crystals which form on the upper part of the vessel from falling into the cooking sirup.

Suggestion.—This would be a good time to give the test for sugar. Have the girls test the candy in the usual household way to determine whether or not it is done, then take the temperature of the boiling solution at this point. Record and compare very carefully the conclusions of the different members of the class.

Reference.—Same as Lesson 64.

Correlation.—Physics: The relation of the boiling point of a solution to its concentration.

LESSON 68.

Problem.—To classify candies and study the principles underlying their preparation.

LESSON 69.

Christmas sewing. (See Lesson 56.)

LESSON 70.

Problem.—To make fondant, applying the principles worked out in the making of fudge.

References.—Same as Lesson 64.

Correlation.—Arithmetic: Estimate cost of fondant.

LESSON 71.

Problem.—To prepare Christmas decorations.

Points to be brought out.—Significance and spirit of Christmas. It is not a time for show nor merely for the exchange of gifts, but a season of happiness and good will to all.

References.—Current magazines; Betts, The Christmas Festival, Cornell Reading Courses, 3 (1913), No. 53.

Correlation.—English: Write Christmas stories.

LESSON 72.

Christmas sewing. (See Lesson 56.)

LESSON 73.

Problem.—A consideration of the place and value of candy in the diet.

Points to be brought out.—Sugar yields energy but no protein. Since it satisfies the appetite very readily, its free use may result in one's not taking a sufficient amount of other more important foods. On this account it should not be eaten before the meal but afterwards. Sugar may cause teeth to decay partly because the person who eats excessive amounts of sugar is not getting the right amount of material—mineral matter—to build teeth. We can not keep well and strong when we allow sugar to take the place of the protein which builds muscle or of the vegetables which supply mineral matter.

References.—Same as Lesson 64; also U. S. Dept. Agr., Farmers' Bul. 535, pp. 26 and 30.

LESSON 74.

Problem.—To make fondant. Duplicate as far as possible candies seen in the stores. Caramels, taffy, and divinity should be prepared this lesson. If it seems desirable and there is time, an extra outside lesson might be given on candy. In this all the girls would be interested. The candy might be sold or, in keeping with the holiday spirit, might be given to the poor in the neighborhood, or the students might furnish their own materials and take home with them the candy so prepared.

References.—Food text. A good recipe book.

LESSON 75.

Christmas sewing. (See Lesson 56.)

LESSON 76.

Problem.—To outline a plan by which an account can be kept of the expenditure of time and money.

Points to be brought out.—We must keep accounts in order to be able to tell whether we are getting adequate returns from our expenditures. We should keep account of the expenditure of time as well as money.

Reference.—Book on household management.

Correlation.—English: Home accounts as related to farm accounts, U. S. Dept. Agr., Farmers' Buls. 511 and 572.

LESSON 77.

Problem.—To review the work on sugars, classify the sugars and sirups.

References.—U. S. Dept. Agr., Farmers' Buls. 535 and 653.

Correlation.—English: Write stories of sugar growing and manufacture, and beet sugar in the United States.

LESSON 78.

Problem.—To plan a nightgown.

Points to be brought out.—The gown should be loose, simple, easily made, and easily laundered. The trimming should be flat and durable. The material should be soft and durable, without finish.

Suggestion for working out.—The kimono nightgown fulfills all these conditions, especially when it is made from 40-inch material. It is easily laundered. It may be ironed flat or may be put through the mangle. If made of crepe, it needs no ironing.

Reference.—Any good book on textiles or clothing.

Correlation.—Arithmetic: Estimate the cost of the nightgown. Drawing: Draw designs.

LESSON 79.

General review.

LESSON 80.

Problem.—To draft the gown.

Points to be brought out.—Simplicity of the drafting and the advantage of adapting it to the individual figure.

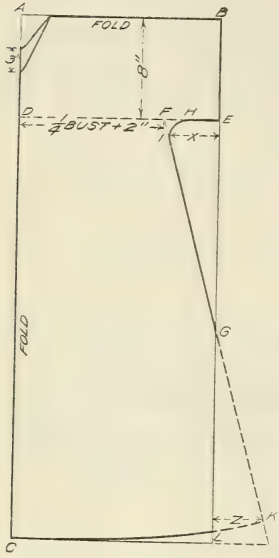

FIG. 1.—Kimono nightgown. Measurements: Length of front—from highest point of shoulder to floor; length of underarm seam; bust measure, loose. No drafting on paper is necessary. Material—at least a yard wide, and as long as twice length of front plus twice width of hem. Fold in half crosswise (line AB). Fold in half lengthwise (line AC). Measure down from line AB to bust line (about 8 inches). Draw DF parallel to AB=one-fourth bust plus 2 inches. HE (continuation of DF. FH=2 inches) forms sleeve seam. Bisect distance from sleeve to bottom of material (point G). Draw line from F to G. Cut out triangle and use to piece out bottom (GKL), sewing straight sides together. Measure GL equal to underarm seam. Curve bottom. Draw neck as desired. Remember that the back of the neck should be 3 inches higher than the front.

Reference.—Any good book giving directions for drafting underwear.

Correlation.—Arithmetic: Keep accurate account of the time spent on drafting and making the different parts of the gown.

LESSON 81.

Problem.—To sew up the seams and hem the gown.

Points to be brought out.—Neatness and careful machine work are essential for beautiful underwear. In the gown the French seam gives the neatest finish. This should be pinned and basted to insure evenness. After some practice the seaming may be accomplished without the preliminary basting, but this should not be allowed until a certain degree of proficiency has been attained. The hem should be turned and basted, then stitched on the machine on the right side.

Reference.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, pp. 64–78.

LESSON 82.

Problem.—To make cornstarch pudding. Substitute other forms of starch for the cornstarch and notice carefully any difference in the resulting flavor and consistency. Determine whether or not flour could be used and how much would be necessary to give the desired consistency.

Points to be brought out.—Cooking at the temperature of boiling water renders starch palatable, and probably slightly more digestible. On this account the pudding is best cooked at least part of the time directly over the fire. The cooking may then be finished in the upper part of the double boiler, where stirring is unnecessary.

References.—U. S. Dept. Agr., Office Expt. Stas. Bul. 202; a good recipe book.

Correlation.—English: Discuss the different sources of starch used as food.

LESSON 83.

Problem.—To finish the neck and sleeves of the gown.

Points to be brought out.—That neatness and simplicity are desirable. The little machine scallops which come in dainty design make a neat and inexpensive finish. Turn the raw edge of the gown one-eighth of an inch toward the wrong side. Hold the narrow scalloped braid that the scallop stands out beyond the edge and at the same time the solid portion of the braid covers the raw edge of the turn. Carefully baste in this position and stitch with two rows on the right side.

Reference.—Same as in Lesson 81.

Supplementary topics.—Discuss the storage of one's personal clothing; the proper distribution of articles in bureau drawers; wardrobes with coat and dress hangers, etc., for both men and women of family. Work out a plan for partitions in a bureau drawer to store separately various kinds of things.

LESSON 84.

Problem.—To prepare cream toast, using flour to thicken the milk.

Points to be brought out.—Dry heat dextrinizes starch, making it more digestible. One tablespoonful of starch is equivalent to two of flour in thickening power. Before adding starch to a hot liquid it is necessary to separate the starch grains by suspending them in a cold liquid.

References.—Textbook on foods; any good recipe book.

Correlation.—English: List the dishes made with toast; tell how to make some one dish which you would like to try at home.

LESSON 85.

Problem.—To launder underwear which requires starch. It should be left to the next lesson for ironing.

Points to be brought out.—The reasons for starching are (1) a glazed surface keeps clean longer; (2) starch gives the material "body," increases its resistance to moisture, and makes it more attractive in appearance. The kinds of starch used are wheat, rice, and cornstarch. Materials stiffened with wheat or rice starch are more flexible than those stiffened with cornstarch.

Reference.—Any good book on home laundry work.

Supplementary topic.—Draw a plan for a home laundry and list the appliances necessary, with prices. (Consult catalogues and visit stores.)

LESSON 86.

Problem.—To iron the underwear washed during the last lesson.

Points to be brought out.—Materials which do not require ironing save much time. Extra time is required to iron elaborately trimmed underwear. Simplicity in trimming and design is desirable.

References.—Rose, The Laundry, Cornell Reading Courses, 1(1912) No. 11, pp. 142–146.

Correlation.—English: Estimate the amount of time required to iron properly narrow ruffles used as trimming. What type of trimming is most easily ironed and at the same time the most durable? Describe different irons available for your home. Compare the cost and the convenience of irons heated on the stove, by charcoal, wood alcohol, etc.

LESSON 87.

Problem.—To make cream soups, using the vegetables which contain very little starch, such as celery, cabbage, collard, cauliflower, or any other green vegetables.

Points to be brought out.—Cream soups are made in the same way as a cream sauce except that the liquid instead of being entirely milk, is composed of part milk and part the liquor in which the vegetable has been cooked, with as much of the vegetable itself as can be softened and rubbed through the strainer. The proportion of flour necessary to make a soup of the consistency of thick cream is one tablespoonful to each cup of liquid. As the amount of solid material in the vegetable liquor is increased, the proportion of flour added may be decreased. It is always necessary to add some flour, however, in order to prevent the heavy particles of vegetable from settling. The proportion of butter added is usually the same as that of flour. It depends in part, however, upon the flavor desired and the part the soup is to play in the meal. (Leave cream tomato soup until the milk lesson.)

References.—U. S. Dept. Agr., Office Expt. Stas. Bul. 245, p. 75; text-book on foods.

LESSON 88.

Problem.—To study the relation of clothing to health.

Points to be brought out.—The primary purpose of clothing is protection, not ornamentation. Clothing should not be so tight as to interfere in any way with freedom of movement. Shoes are made to protect the feet and to facilitate walking, not to make it more difficult. The clothing should be such as to admit of the proper ventilation of the body.

Reference.—Textbook on clothing.

Correlation.—English: Write a composition comparing American and Chinese styles.

LESSON 89.

Problem.—To make a bowl of palatable potato soup, and a variety of other cream soups from any available vegetables.

Points to be brought out.—The value of cream soups as a means of utilizing skim milk on the farm. A cream soup may be made nutritious enough for the principal dish at a meal. It should be made very thin if it is to serve as the first course at a full dinner. In the latter case whipped cream should not be added to the soup.

Correlation.—English: List all the different cream soups you have ever eaten or heard of, and tell how to make one which you would like to try at home.

LESSON 90.

Problem.—To plan a suit of underwear.

Point to be brought out.—The garments should be adapted to the purpose for which they are intended. There is much chance for improvement along this line.

References.—Clothing text. Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2. The intelligent study of any current pattern magazine.

LESSON 91.

Problem.—To draft the drawers. The design should have been selected in the previous lesson.

References.—Same as in Lesson 90.

Suggestion.—A draft for circular drawers may very easily be adapted from one for a circular belt or peplum. The latter may be drafted as follows:

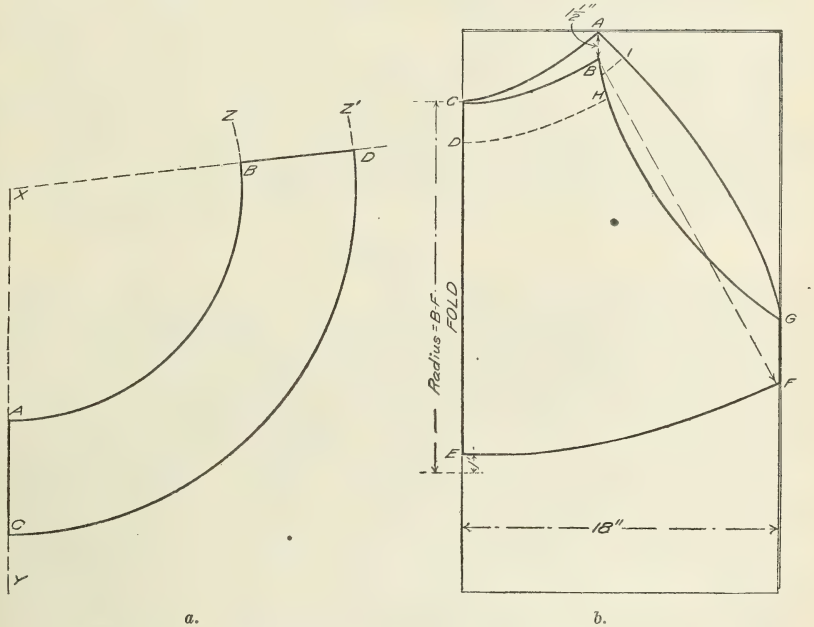

FIG. 2.—Directions for drafting circular belt: The measurements required are the waist measure and the depth of the belt. Draw a line of indefinite length (fig. 2*a*, XY). On this line mark point A at a distance from X equal to one-third the waist measure. Using X as a center and XA as a radius, draw an indefinite arc, AZ. On this arc mark point B distant from A by one-half the waist measure. From A on line XY measure the depth of the belt and mark the point C. Using X as a center and with XC as a radius draw an indefinite arc, CZ′. Draw a line from X to this arc through B and mark the point of intersection D. ACDB equals one-half the belt. In cutting lay line AC on lengthwise fold of the paper or goods. Directions for drafting circular drawers: Fold the pattern for circular belt as shown in figure 2*b* (AI–CD–BH). The line CD is folded in such a way that B is 1½ inches below A. Lay on paper 36 inches wide, folded down the center. The fold CD should be placed upon a fold of the paper. From C measure the length desired for the side of drawers, that is, down over the hip (CE). With B as a center and a radius equal to CE plus 1 inch, cut the edge of the paper at F. On the edge of the cloth measure up from F 3 to 4 inches for the leg seam, and mark this point G. Connect A and G and B and G as shown in the illustration. This pattern represents one leg of the pair of drawers.

LESSON 92.

Problem.—To prepare some typical cereal breakfast foods.

Points to be brought out.—The value of the fireless cooker in the preparation of cereals. Cereals vary in composition according to the kind and part of grain used.

References.—U. S. Dept. Agr., Farmers' Buls. 105*, pp. 19–22; 237*, pp. 14–18; 249, and 316*, pp. 17–19.

Correlation.—Arithmetic: Calculate cost of individual servings of the various cereals.

LESSON 93.

Problem.—To prepare cornmeal mush, grits, hominy, and spoon bread.

Points to be brought out.—The grits or small hominy should be prepared by boiling as you would a very coarsely ground cornmeal. The large pearl hominy requires several hours at the boiling point in order to be sufficiently cooked. It lends itself especially well to preparation in the fireless cooker. Save any of the mush, grits, and hominy left for use at the next lesson.

References.—U. S. Dept. Agr., Farmers' Buls. 298 (Hulled corn, p. 21); 565 (Cornmeal mush, p. 10; Spoon cornbread, p. 19).

Supplementary topic.—Describe the construction of a homemade fireless cooker; of an improvised one for use in camping.

LESSON 94.

Problem.—To use left-over cereals.

Points to be brought out.—The mush or the grits from the last lesson may be reheated by frying. (Farmers' Bul. 565, p. 11.) Reheat the hominy in a skillet with a little fat. During the first part of the operation the mass may be stirred. Toward the last, the stirring is discontinued and a crust is allowed to form on the underside. In serving, this side is turned to the top of the dish. Polenta, an Italian dish, may be made from the mush by cutting it in slices in a baking dish and then sprinkling it with grated cheese, salt and pepper, and putting it in the oven until it is heated through and the cheese is browned. The variety of ways in which we may serve cornmeal and other corn products and the economy of cornmeal as a food should be emphasized.

References.—U. S. Dept. Agr., Farmers' Buls. 298, 558*, and 565.

Correlation.—English: List all the commercial cereal products, classify them in various ways. (Consult stores and catalogues.)

LESSON 95.

Problem.—To cut and seam the drawers.

Points to be brought out.—A fell made by machine on the right side of the garment gives a neat, strong finish. There is no special advan-

tage in the hand fell except where the seam is curved, and the machine will not make a flat finish.

Reference.—Same as in Lesson 90.

Correlation.—Arithmetic: Estimate the cost per hour of a sewing machine which costs $25, lasts 20 years, and is used one hour a week.

LESSON 96.

Problem.—To wash woolen underwear.

Points to be brought out.—Strong alkalis dissolve wool. Weak solutions dissolve only small amounts of the fiber, causing it to contract or shrink. Use soap free from any excess of alkali. Very hot water or sudden changes from water of one temperature to that of a very different temperature is undesirable in the case of woolens. The character of the wool fiber is such that it tends to mat if rubbed too much.

Reference.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11.

Correlation.—English: Write descriptions of the appearance of wool fiber under the microscope.

Supplementary topic.—Discuss different plans by which running water could be put into your house, or some other house of which you know, and their comparative cost. (Consult Farmers' Bulletins and catalogues.)

LESSON 97.

Problem.—To cook rice.

Points to be brought out.—In serving rice as a vegetable we wish to have the grains separate rather than in a gummy, pasty mass. This is accomplished by thorough washing to remove any adhering particles of starch, cooking rapidly in so much water that no stirring is necessary, or by cooking in a smaller amount of water in the double boiler, or the fireless cooker, and driving off the excess of moisture by heating after the cooking has been finished. These different ways should be tried in class. Unpolished rice is more nutritious than polished.

References.—Bulletin on Texas and Louisiana Rice, Pass. and Ind. Dept., Southern Pacific R. R., New Orleans, La.; Miriam Birdseye, Rice and Rice Cookery, Cornell Reading Courses, 3 (1914), No. 55.

Correlation.—English: Write stories of the way rice is grown. Name different rice dishes you have known; describe the making of one you like. To what country do we owe rice?

LESSON 98.

Problem.—To make placket and band on drawers.

Points to be brought out.—A good placket for drawers may be made with linen tape about three-fourths of an inch wide. (See Handy and Pract. Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, p. 68.) If the waistband is to be stitched on, apply it to the wrong side first, so that

the final line of stitching will come on the right side. Instead of a band a flat, fitted binding or yoke about 2 inches wide may be used around the top.

References.—Same as in Lesson 90.

Correlation.—English: Write description of the different kinds of plackets and their uses. Compare cost of home-made and ready-made underwear. Is woman's home work worth money?

LESSON 99.

Problem.—Cereals and their value in the diet.

Points to be brought out.—Cereals contain all the necessary material for the formation of the new plant. The outer layers contain the largest proportions of mineral matter, and also of plant fiber; the inner sections are richest in energy-yielding starch.

Reference.—U. S. Dept. Agr., Farmers' Bul. 249.

Correlation.—English: Look up the countries in which the different cereals are grown and list them. Could any new cereal be introduced into your community?

LESSON 100.

Problem.—To finish the bottom of the drawers, make buttonholes and sew on buttons.

Points to be brought out.—Finish the bottom of the drawers in the same way as was done with the neck and sleeves of the gown. The traditional finish, a ruffle, is not only more work in making and difficult to launder, but is objectionable in that it gives an excessive amount of fullness at a point where fullness is not desirable.

References.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, pp. 70, 71; clothing text.

Correlation.—English: Discuss simplicity in dress. How far is the elaborateness, which means extra work, justifiable in woman's dress?

LESSON 101.

Problem.—Wash a wool sweater.

Points to be brought out.—A neutral soap must be used, since an excess of alkali injures the fiber. The water used should not be too hot, and the successive waters should be of uniform temperature, for rapid expansion and contraction of the fibers tend to cause felting and shrinking. Too much rubbing also tends to felt or mat the fibers.

Reference.—Any good book on home laundry work.

Correlation.—English: Find cost for power-driven washers of various types—cost per week. (Consult catalogues for laundry equipment.)

LESSON 102.

Problem.—To prepare tapioca, macaroni, and spaghetti.

Points to be brought out.—These are often prepared in an unappetizing way. We should aim to season them well and not allow them

to become too dry. Macaroni should be cooked until tender in boiling, salted water. A good way to serve it is to put layers of the boiled macaroni in a baking dish with cream sauce and cheese between, cover with buttered bread crumbs, and bake.

References.—Textbook on foods; any good recipe book.

Correlation.—English: Write description of the process of manufacture of these cereal products.

LESSON 103.

Problem.—To select a design and pattern for a princess slip or a one-piece garment to take the place of corset cover and skirt. To determine the size required.

Points to be brought out.—This furnishes a good opportunity for the discussion of the value of patterns and the means of determining the size needed. Two or three sizes should be selected according to the variations in the measurements of the different members of the class.

References.—Current fashion magazines. Reference in Lesson 90.

Correlation.—Arithmetic: Estimate in advance the amount of material necessary and the cost; then keep a record of money and time actually spent.

LESSON 104.

Problem.—To cook peas, beans, lentils, and cowpeas.

Points to be brought out.—Beans and peas soften more quickly when cooked in soft water than when cooked in hard water, for the calcium in the hard water unites with some of the protein in the peas and beans to form a hard compound. It is sometimes possible to soften water by means of baking soda, but since the cook can not easily know how much soda is needed for the water in question, and since the soda may injure the flavor of the food, it is perhaps better to soften the water by boiling it previously if the character of the hardness permits of its being remedied in this way, or to use rain water.

References.—U. S. Dept. Agr., Farmers' Buls. 121; 256, pp. 21–27; 559.

Correlation.—Chemistry: Action of soda on hard water. English or agriculture: Discuss a plan for a vegetable garden for your own homestead.

LESSON 105.

Problem.—To adapt the pattern to the individual girl and cut the princess slip.

Points to be brought out.—Each girl should cut a duplicate of the pattern which is nearest her size and adapt it to her measures. The slip should be carefully fitted before seaming on the machine, and any necessary corrections made in the paper pattern.

Reference.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, pp. 53–57.

Supplementary topic.—Make an inventory of your own wardrobe, with costs, for your own information.

LESSON 106.

Problem.—To fit and seam the princess slip.

Points to be brought out.—French or felled seams are the most satisfactory. For the back either the hemmed or the faced placket may be used since either fits smoothly.

Reference.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, p. 68.

Supplementary topic.—Child labor and the cotton industry, on the plantation and in the mill.

LESSON 107.

Problem.—To cook legumes in any special way.

Points to be brought out.—Legumes are not to be scorned. A little care in their preparation makes them valuable and appetizing additions to the dietary.

References.—U. S. Dept. Agr., Farmers' Buls. 121; 256, pp. 21–27; and 559.

Correlation.—English: Write on the raising of some one legume which your family has not usually raised.

LESSON 108.

Problem.—To discuss the value of the legumes in the diet.

Points to be brought out.—Legumes are valuable as a source of protein in the diet and on this account are useful as a substitute for meat. They also contain mineral salts which the body needs.

References.—U. S. Dept. Agr., Farmers' Buls. 121; 256, pp. 21–27; and 559.

Correlation.—Arithmetic: Calculate the cost of definite amounts of protein obtained from one of the legumes. Compare with the cost of equal amounts of protein from meat.

LESSON 109.

Problem.—To make soups from peas and beans. Use either water or skim milk as the liquid.

Points to be brought out.—Judicious seasoning and the addition of fat are necessary in order to develop a desirable flavor. These soups, especially those prepared with milk, have a high nutritive value.

References.—U. S. Dept. Agr., Farmers' Buls. 256, p. 25; and 559, p. 11.

Correlation.—Agriculture: The relation of legume crops to renewal of soil fertility. Plan a rotation of crops including a legume. What legume crops have been raised in your community? What would be good for your farm?

LESSON 110.

Problem.—Final fitting of the princess slip and turning of the hem.

Points to be brought out.—The bottom of the skirt should be protected in some way to prevent wearing. The traditional way is with a dust ruffle, but this is not always desirable when worn with a narrow dress skirt. In that case it may be better to use a small, heavy machine-embroidered scallop or the zigzag braid which comes for that purpose.

Supplementary topic.—What is the proper length of skirt for an infant, for a girl of 8 years, of 14 years, an adult woman? Should skirts ever trail on the ground? What is the ideal width for a skirt from the standpoint of comfort, regardless of style?

LESSON 111.

Problem.—Mending.

Correlation.—English: Plan and describe a systematic and orderly way of caring for mending supplies and materials, as in a special work table with drawers having partitions, or a set of boxes or baskets.

LESSON 112.

Problem.—Composition of nuts and their value in the diet.

Points to be brought out.—Nuts are rich in protein and fat and these nutrients are present in a form that is fairly easily assimilated. Since they are concentrated foods they should not be used in quantity with a heavy meal, and only in combination with more bulky foods. Nuts are used as an ingredient of salad, in soups, as a stuffing for poultry, in the making of desserts, and in many other ways.

Reference.—U. S. Dept. Agr., Farmers' Bul. 332.*

Correlation.—Geography: Look up countries in which the typical nuts are raised. Which nuts are adapted to your own locality? How could you secure new varieties for your own homestead? (See catalogues.)

LESSON 113.

Problem.—To finish the neck and sleeves of the princess slip, make buttonholes and sew on buttons.

Points to be brought out.—Whether the neck of the slip should be finished with fullness or flat depends partly on whether it is to be worn under a loose or a tight-fitting garment. If it is to be worn directly under a thin material it should be high enough in the neck and broad enough over the shoulders to cover the other undergarments.

Correlation.—Arithmetic: Compute actual money and time expended in making slip and compare with estimate (Lesson 103).

LESSON 114.

Problem.—To review vegetable foods in general.

LESSON 115.

Problem.—To review the sewing work and score the underwear made.

Suggested score.—(This is adapted from a score given by Miss Mary L. Matthews, Extension Bulletin 23, Purdue University, Lafayette, Ind.)

Score card for underwear.

	Points.
I. Structure:	
(*a*) Suitability of design to use	10
(*b*) Choice of material	5
(*c*) Choice of trimmings	5
(*d*) Width and evenness in size of:	
1. Seams	2
2. Hems	2
3. Tucks	2
4. Bands and trimmings	2
5. Gathers. (When there are no gathers let these points go under 4)	2
(*e*) Accuracy of cutting	10
II. Stitches:	
(*a*) Appropriateness	5
(*b*) Evenness and neatness	15
(*c*) Size	10
III. Finishing:	
(*a*) Buttons and buttonholes	10
(*b*) Fastening of thread ends	5
(*c*) Removal of bastings	5
IV. General appearance:	
(*a*) Cleanliness of work	6
(*b*) Pressing	4
Total	100

LESSON 116.

Problem.—To study insects as a means of transmitting disease. To plan and inaugurate a campaign against the fly.

Points to be brought out.—The fly may distribute disease germs to food. By killing the first flies that appear before they have had a chance to breed, it is much easier to keep their numbers down.

References.—U. S. Dept. Agr., Farmers' Buls. 155*; 412*, p. 11; and 679.

Correlation.—English: Write a story of how a fly helped spread a disease. Make a plan for controlling flies on your farm and for eradicating mosquitoes.

LESSON 117.

Problem.—Soft cooking of eggs. Cook eggs in boiling water for 3, 5, 7, 14, 30, and 60 minutes. Cook eggs for the same lengths of time in water which is boiling when the eggs are introduced, but which is set aside and not allowed to boil after the introduction of the eggs. Break the eggs and compare the consistency.

Points to be brought out.—Eggs coagulate at a temperature below the boiling point of water. When cooked in boiling water the outside is overcooked and in many cases the yolk is not completely heated through.

Reference.—Eggs and Their Value as Food, U. S. Dept. Agr., Bul. 471.

Correlation.—English: Write a story of a girl who made money to go to college by keeping poultry.

LESSON 118.

Problem.—Putting away winter clothing. The best means of preventing moths.

Points to be brought out.—The eggs from which moths develop may be present. These must be killed or removed before the clothes are put away, for they may find in the packed clothes ideal conditions for their development. Since it is difficult to be sure that all moth eggs are removed, the clothing is usually packed under such conditions as to retard their development.

References.—U. S. Dept Agr., Bur. Ent. Circ. 77; Farmers' Bul. 659.

Correlation.—English: The life history of the moth. What other insect pests has the housewife to fight? (See U. S. Dept. Agr., Farmers' Buls. 626, 627, 658, 679, and 681.

LESSON 119.

Problem.—Apply the principles worked out in Lesson 117 by preparing poached eggs on toast, scrambled eggs, and eggs in any other way that the girls wish to try.

Points to be brought out.—A more digestible and palatable product results when the cooking process is carried out at a temperature below that of boiling water.

References.—Textbook on foods; any good recipe book.

Correlation.—Physiology: Show in what ways the method of cooking eggs may affect their digestibility.

LESSON 120.

Problem.—To select a design for a simple skirt and draft the foundation skirt pattern.

Points to be brought out.—A well-fitted foundation skirt pattern can be adapted to various skirt designs. Such a pattern is better suited to an individual than stock sizes of the commercial pattern.

Reference.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, pp. 34–37, 53–55.

Correlation.—English: Discuss clothing as an expression of personality.

LESSON 121.

Problem.—To make a flytrap. Discussion of best methods of eradicating flies.

Points to be brought out.—The best method of eradicating flies is by cleaning up the filthy places in which they breed. We may "swat" the flies, catch them in traps, or we may prevent their access to any water supply except one that contains poison. Screening of houses is an absolute necessity in fly-infected communities.

References.—U. S. Dept. Agr., Farmers' Buls. 133*, p. 25; 532*, p. 22; 679.

Correlation.—English: Make a list of the wood-working tools which every housekeeper should have at hand, with prices. (See catalogues.)

LESSON 122.

Problem.—The composition of eggs and their value in the diet. Effect of cooking on their digestibility.

Points to be brought out.—Eggs are valuable as a source of protein and mineral matter in the diet. The digestibility depends not only upon the temperature at which they are cooked, but also upon the flavor and the ease and fineness of division.

References.—U. S. Dept. Agr., Office Expt. Stas. Bul. 143; Langworthy, Eggs and Their Value as Food, U. S. Dept. Agr., Bul. 471.

Correlation.—Arithmetic: Calculate the cost of protein food as obtained in eggs at the prices customary at different seasons of the year.

LESSON 123.

Problem.—To adapt the pattern of the foundation skirt to the design selected and to cut skirt.

Points to be brought out.—The foundation skirt may easily be modified in accordance with the different designs.

Reference.—Same as in Lesson 120.

(Drafting is advisable wherever possible, but if necessary a commercial pattern may be used instead.)

Supplementary topic.—Make a list of the articles of clothing desirable for a girl of 10 years on a farm.

LESSON 124.

Problem.—To make an omelette.

Points to be brought out.—An omelette is an egg mixture cooked in a pan over the flame. It is usually made light by the expansion of air incorporated in the white. Milk is added to make the mixture more tender, but should not be added in a proportion larger than one tablespoonful to each egg because the mass becomes too liquid. Cream sauce may be added in amounts up to one-third cup for each

egg. In cooking, the aim should be to heat the mixture sufficiently first to cause the incorporated air to expand, and then to coagulate or "set" the albumen which constitutes the walls of the air-containing cells. Heat must be applied gradually, else the underneath portion is overcooked before the mass is heated through. The top should not be browned. If the top is not completely cooked, it may be dried by placing the pan in the oven about 30 seconds.

References.—Textbook on foods. Any good recipe book.

Supplementary topic.—Name of the varieties of poultry of which you have heard. Which kind would you prefer for a family flock? Which, if you were keeping them for commercial profit?

LESSON 125.

Problem.—To baste and fit the skirt.

Points to be brought out.—The first skirt should be fitted carefully and the necessary corrections made on the pattern. If the skirt is to be French seamed, be sure the seams are basted on the right side with edges of the proper width.

Reference.—Same as in Lesson 120.

LESSON 126.

Problem.—To wash table napkins and remove stains.

Points to be brought out.—A stain is caused by the deposition of some material. Since the action of hot water and soap sometimes renders insoluble materials which are in the beginning soluble, it is wiser to remove all stains possible before commencing the washing operation.

In order to remove a stain a solution must be found in which the stain is soluble and which is not harmful to the fabric. Make a list of the reagents which should be present in every laundry for use in the removal of stains. Make a list of the ordinary stains occurring on household textiles with a corresponding list of the reagents which will remove these stains.

Reference.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11, pp. 128–132.

Supplementary topic.—Describe the growing of flax and the making of linen. Discuss ways of making the table attractive when linen can not be afforded. Cost of paper napkins; of oilcloth. Discuss the use of flowers upon the home table.

LESSON 127.

Problem.—To make a sponge cake.

Points to be brought out.—True sponge cake contains both the white and the yolk of the egg. It is made light by the expansion on heating of the air incorporated in the egg white. Lemon juice is added for flavor and for the effect that the acid has on the texture. The

cake may be cheapened by substituting for some of the eggs a liquid, preferably water, and baking powder, in the proportion of one-half teaspoonful of baking powder and two and one-half tablespoonfuls of water for each egg. The general proportions for sponge cake are one-fourth cup of flour and one-fourth cup of sugar to each egg, or equal amounts of egg, flour, and sugar, since each egg is supposed to measure one-fourth cup. Bake in an oven at 175° C. (350° F.).

References.—Textbook on foods. Any good recipe book.

Correlation.—Physics: Expansion of air.

Supplementary topic.—Discuss the omission of elaborate desserts in a home in which the mother is overworked. List desserts suitable for different occasions during the year.

LESSON 128.

Problem.—To seam the skirt.

Points to be brought out.—The kind of seams used should be adapted to the material. If it is heavy, the seams should be tailor-stitched and the edges overcast or bound. If it is light, French seams may be used.

References.—Same as in Lesson 120.

Supplementary topic.—Discuss means of keeping the father's and brother's clothing neat and attractive—proper ways of folding and hanging, coat forms, pressing, "dry cleaning," etc. Neatness in working clothes. How often should overalls be washed?

LESSON 129.

Problem.—To determine the reasons for the great fluctuations in the price of eggs. Preservation of eggs.

Points to be brought out.—Large numbers of eggs are lost through inefficient handling in the homes and on the farm. Infertile eggs keep very much longer than the fertile ones. Water glass is very useful as a preservative. Evidence seems to point to the spring egg as the best to preserve.

References.—U. S. Dept. Agr., Farmers' Buls. 103*, p. 17; 273*, p. 17; 296*, p. 29; 353*, p. 14; Production and Handling of Market Eggs, Mo. State Poultry Expt. Sta. Bul. 5 (1915).

Correlation.—Arithmetic: Calculate the increase in price of 50 dozens of eggs when held over from April until December, allowing for cost of water glass, crocks, and time necessary in handling. How many eggs might well thus be preserved for your family? How much would be saved by using preserved eggs and selling your fresh eggs in winter?

Supplementary topic.—Describe a plan for a cooperative egg-shipping association; the shipping of eggs by parcel post. U. S. Dept. Agr. Farmers' Bul. 656, Community Egg Circle.

LESSON 130.

Problem.—To put the placket in the skirt and sew on the band.

Reference.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2.

Supplementary topic.—Is it better to buy good fabrics for women's dresses and men's suits expecting garments to last several years, or to buy unsubstantial material and discard it after a short time?

LESSON 131.

Problem.—To iron linen by hand and in a mangle. Comparison of the amount of time used in each case. Suggestions for substitutes for ordinary table linen which can be cared for with less expenditure of time and energy.

Points to be brought out.—Much time can be saved by putting table linen through a mangle rather than ironing it by hand. Doylies and table mats require less time to launder successfully than the larger pieces.

Reference.—Any good book on home laundry work.

Correlation.—Arithmetic: Calculate amount of time saved by the use of a mangle in the laundry work for a family of six. How long will it take a mangle to pay for itself? (See catalogues.)

LESSON 132.

Problem.—To make angel and sunshine cakes.

Points to be brought out.—An angel cake differs from a sponge cake in that we use the whites only and none of the yolks of the eggs. The proportion is in this case as before, equal measures (by volume) of egg white, sugar, and flour. One white is approximately one-eighth of a cup. Since the egg white contains so large a proportion of water, we add our acid in this case in the form of a solid, using cream of tartar instead of lemon juice, and substituting some other form of flavoring.

A sunshine cake comes just halfway between the angel cake and sponge cake. In it we use both the white and the yolk of the egg, but the number of whites used is larger than the number of yolks. The use of these cakes is to be encouraged, especially during the time of the year when eggs are cheap and abundant.

References.—Any good recipe book. Textbook on foods.

Correlation.—Arithmetic: Calculate cost.

Supplementary topic.—What do similar bakers' cakes cost? Why do we still bake cake at home? Is this wise if the mother is overworked?

LESSON 133.

Problem.—The preparation of custards. (This lesson should follow immediately the lesson on angel cake in order to utilize the egg yolks left over from the cake.)

Points to be brought out.—The value of starch and flour as a means of thickening liquid has already been studied. The object of this lesson should be to give the students some idea of the value of the egg as a means of thickening and of the proportion in which it should be used. We have two classes of custards—soft and hard, depending upon the proportion of egg used and the method of cooking. Custards should always be cooked over or in hot water. "Boiled custard" is a misnomer. It should be called "soft."

References.—Textbook on foods. Any good recipe book.

LESSON 134.

Problem.—To finish the skirt.

Points to be brought out.—The bottom may be either hemmed or faced. All loose ends of thread should be carefully fastened.

References.—Textbook on clothing. Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2, pp. 71 and 72.

Supplementary topic.—Discuss ways of putting away skirts so that they shall keep their shape; plan a method adapted to your own home.

LESSON 135.

Problem.—To press and score the skirts, and review the problems involved in making them.

Reference.—Univ. Mo. Bul., 15 (1914), No. 7.

Correlation.—English: The score-card method of judging may be applied to any subject the quality of which depends on several factors. Secure score cards for sanitary conditions in dairy, for judging stock (U. S. Dept. of Agriculture), for jams, jellies, etc.

LESSON 136.

Problem.—To wash a colored dress, preferably one which is in danger of fading.

Points to be brought out.—Colors fade on account of (1) the long continued action of water and soap, (2) the use of strong acids or alkalis, and (3) exposure to strong sunlight. In order to prevent the fading of colors we avoid so far as possible the above conditions, and in the case of especially fleeting dyes we attempt to set the color. Setting the color is accomplished by the use of a mordant, that is, a material which will bring about a stronger union between the cloth and the dye. Make a list of the chemicals most frequently used in setting colors, the proportion, and the colors for which they are used (Rose, The Laundry, p. 139). A sample of the material whose color is to be set should be tested in each of the mordants and then washed. From the results one can determine which is the best to use. Apply this at the next lesson in the washing of the dress, observing all the above suggestion.

References.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11, p. 139; any good book on home laundry work.

Correlation.—English: Discuss clothing waste from cheap dyes; draw conclusions from personal experience and observation.

LESSON 137.

Problem.—To make a cheap sponge cake.

Points to be brought out.—By the substitution of water and baking powder for part of the egg we may cheapen the sponge cake. Custards may be cheapened by the substitution of flour for part of the egg. Angel cakes and sunshine cakes may be cheapened in the same way as the sponge cake.

References.—Textbook on foods. A good recipe book.

Correlation.—English: Explain the basis of the substitution and calculate how much is saved by it.

LESSON 138.

Problem.—General review of egg cookery.

References.—U. S. Dept. Agr., Office Expt. Stas. Bul. 43; Farmers' Bul. 471.

Supplementary topic.—Discuss: How far can the average southern homestead produce to advantage all the foodstuffs required for its own table? How can a larger variety be produced than at present?

LESSON 139.

Problem.—To plan a waist. Each girl should submit a design. These should be discussed in class and modified if necessary.

Points to be brought out.—A desirable design is simple and does not involve too much work.

References.—Textbook on clothing; current fashion journals.

Correlation.—Arithmetic: Estimate the probable cost of the waist planned, in both money and time.

Supplementary topic.—Discuss simplicity in dress and indicate desirable standards of simplicity, taking into account cost, durability, expense and labor of laundering, etc.

LESSON 140.

Problem.—To draft a waist pattern.

Points to be brought out.—In drafting we are aiming to get a pattern adapted to the measurements of the individual. The system used should be as simple and rational as possible. Try the draft before using to be sure that it will work. Be sure that you understand each and every step and know the reason for each one. The simplest draft with the fewest arbitrary directions is the best. Go over it with the class and be sure that they understand each and every step

before starting the work. In this way drafting can be made a rational process and not a mere following of directions. Let the girls work in groups of two for taking measures and fitting.

References.—Textbook on clothing; any reliable and simple drafting system for a waist.

Supplementary topic.—Investigate the condition of the various types of workers in clothing establishments near your home, e. g., workers by the day, custom workers with their own shops; compare the business arrangements, wages, etc. Is there need of improvement?

LESSON 141.

Problem.—Ironing of a colored dress. Pressing cotton and linen dresses.

Points to be brought out.—The iron should not be too hot. The dress should be ironed on the wrong side. Frequent pressing improves the appearance of cotton and linen dresses.

Reference.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11, pp. 127 and 145.

Correlation.—English: Discuss proper storage of clothing as a means of reducing amount of pressing necessary; describe desirable equipment for ironing for your own home, e. g., the best kind of board. (See catalogues.)

LESSON 142.

Problem.—Finish and correct waist drafts, checking every measure carefully. Cut out in cheap lining material to be fitted.

Points to be brought out.—Exactness is the most important factor in successful drafting. All the measures should be checked up to be sure that they are accurate. As a final precaution, a waist should be cut from cheap material and fitted. This fitted pattern is the one to be kept.

Correlation.—English: Discuss exactness or precision in workmanship as needed by the housekeeper in sewing, in cooking, in care of sick, etc.

LESSON 143.

Problem.—Preparation of cream tomato soup and a cup of chocolate or cocoa.

Points to be brought out.—Acid curdles milk. This effect is hastened by heating. It is retarded by thickening either the tomato juice or the milk before combining them or seems to be because the thickened liquid holds in suspension any curd that may be formed. Therefore, in order to prevent the curdling of tomato soup we thicken either the milk or the tomato juice with the requisite amount of flour and combine them at the proper temperature for serving. The use of soda to

neutralize the acid is not recommended since it may destroy the delicate flavor of the tomatoes, and, if used in too large quantities, is likely to cause indigestion. It is almost impossible to tell when just the correct amount has been used, since the acidity of tomatoes varies to such an extent. In boiling the milk to make the cocoa, the scum usually formed on the surface can be prevented by stirring the milk or by boiling it in a covered vessel.

References.—Textbook on foods. Whipping cream, U. S. Dept. Agr., Farmers' Bul. 384*, pp. 19–22.

Correlation.—English: Describe the growth and manufacture of cocoa and chocolate; list the different brands available in your neighborhood, with prices. (Consult stores and catalogues.)

LESSON 144.

Problem.—To fit the waist pattern.

Suggestion.—The pattern cut in Lesson 142 should be very carefully fitted and trimmed off at the neck and sleeves. When it is correct in all details mark the line of the seams, rip the pattern apart and trim the edge evenly, allowing one-half to one-fourth an inch for seams. This is sufficient to admit of French seams being made. Be sure that the seams are evenly trimmed. Cut the pattern in half down the center front and the center back. (It may seem a waste of time to draft and fit a pattern in this way, but it will more than repay you in the amount of time saved later.)

Correlation.—English: Make the briefest possible list of patterns which could be adapted to the cutting of the garments made in your own family. How could you best store patterns systematically?

LESSON 145.

Problem.—To prepare cottage cheese. It may be used in making sandwiches for a picnic for which the rest of the luncheon may be planned in class.

Points to be brought out.—The curd is separated from the whey more completely if the mixture is slightly heated. This separation is accomplished by heating to 40° C. (104° F.). Heating to a higher temperature than this toughens the curd. A picnic luncheon should be appetizing, abundant, and easily carried.

References.—U. S. Dept. Agr., Farmers' Buls. 202*, p. 28; 430*, p. 10.

Correlation.—English: Write an account of this picnic. List the places available for neighborhood picnics near your home. Is there a place on your farm where you could arrange an outdoor fireplace for occasional family picnics? Describe plans for such a picnic.

LESSON 146.

Problem.—To plan the different steps in the family washing.

Points to be brought out.—Tuesday is the best day for washing, as this leaves Monday free for the mending, and gives opportunity for putting the clothes to soak on Monday night, if soaking is considered necessary. The steps in washing should be worked out in an orderly manner. Let each girl do her washing one week, treating it as she would a family washing and giving a definite reason for each step.

Reference.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11, p. 132.

Correlation.—English: Describe a plan for using a town laundry by means of parcel post. Work out the cost of your average family washing, including post charges to nearest laundry. (N. B.—Some southern families send laundry to distant city laundries.)

LESSON 147.

Problem.—To make rennet custard, and look at milk and cream under the microscope.

Points to be brought out.—Rennet is an enzym and acts best at the temperature of the body. It is killed if heated to the boiling point. If added to milk which has previously been heated and cooled, it either does not clot, or forms a curd which is less dense, according to the length of time the heating has been continued. On this account, when chocolate is to be added it is better to melt it in a small portion of the milk and then combine with the remainder. The fat is present in the milk in minute droplets. Such a mixture is called an emulsion.

References.—Textbook on foods; U. S. Dept. Agr., Farmers' Bul. 457*, p. 21.

Correlation.—Physiology: Study of enzyms and the conditions under which they act best.

LESSON 148.

Problem.—To adapt the drafted pattern to the waist planned.

Points to be brought out.—By slight changes the simple shirt waist draft can be adapted for use with more complicated designs. Tucks should be put in and allowance made for any fullness before the waist is cut out. Where the design is at all complicated a paper or cloth pattern should be cut first and tested by holding up to the figure.

References.—Textbook on clothing. Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2.

Correlation.—English: Criticize the waists from the standpoint of artistic design.

LESSON 149.

Problem.—Buttermaking.

Points to be brought out.—In churning we are aiming to control conditions which make the small globules of fat coalesce.

References.—Farm Buttermaking, U. S. Dept. Agr., Farmers' Buls. 92*, p. 23; 133*, p. 30; 186*, p. 29; 384*, p. 22; 412*, p. 28; 541.

Correlation.—English: Discuss cream separators, those driven by hand and by gasoline engines; costs. Similarly discuss churns. (See catalogues.) Is it possible in your community to sell or ship milk? Cream? How could a market be secured? Has a cooperative creamery been discussed? (Farmers' Bulletins.)

LESSON 150.

Problem.—To fit and seam the waist, joining the seams with beading.

Points to be brought out.—A convenient way to use beading in a seam is as follows: Baste and fit the seam as usual. Mark carefully the line where the beading is to come, and rip the seam apart. Lay the right sides of the insertion and of the waist together, baste and stitch along the line of the seam so that the stitching comes exactly at the edge of the embroidery. The stitching will not show on the right side of the waist. Face back with the plain muslin at the side of the embroidery. This makes a neat and dainty finish for thin waists. It is quite as effective as when the beading is rolled and whipped in by hand, and is much more durable.

Reference.—Textbook on clothing.

Supplementary topic.—What garment could you make for your father—a cravat, a dressing gown, slippers, a lounging jacket? Do proper clothes help people to rest, to play?

LESSON 151.

Problem.—To wash a soft silk waist.

Points to be brought out.—The same care should be taken as in the case of wool. While the fiber is not so easily affected by alkali or acid, it is usually more fragile, and must be handled carefully.

Reference.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11, p. 140.

Correlation.—English: Stories of silk culture. Can it be introduced into the South?

LESSON 152.

Problem.—To determine the proportion of cream in ordinary milk, the percentage of fat in cream, and to make ice cream.

Points to be brought out.—A great variety of flavors is possible in ice creams. Fillers are used to add to the body of an ice cream. Fillers are starch, eggs, and pastry products. A binder prevents

crystallization on standing. Binders are gelatine and vegetable gums. The percentage of fat in ordinary cream should be determined.

References.—Bacteriological Study of Ice Cream, U. S. Dept. Agr. Bul. 303; Ice Cream, Vermont Expt. Sta. Bul. 155.

Correlation.—Physics: Use of ice and salt in making ice cream. Latent heat. Kinds and costs of ice cream freezers. (See catalogues.) If you have a gasoline engine at home, how could it be attached to turn the freezer? Make drawing. Milk tester; cost. (See catalogues.)

LESSON 153.

Problem.—The value of milk as food and the care of milk in the home.

Points to be brought out.—Milk is provided as food for the young. It contains all the food nutrients but they are not present in the proper proportion for an adult. It is food for bacteria as well as human beings, so it must be especially protected against their entrance. They cause the souring of milk and in other ways render it unfit for human food.

References.—U. S. Dept. Agr., Farmers' Buls. 363 and 413.

Supplementary topic.—Different breeds of cows. Which do you prefer for a family cow? Which for a money-making herd? The household refrigerator, construction and cost. (See catalogues.)

LESSON 154.

Problem.—To make the sleeves for the waist and continue the work on it.

Points to be brought out.—The most difficult thing in fitting a sleeve is to adjust the shape and fullness at the armhole. Sometimes sleeves are cut in one piece with the waist. This saves work, but it is hard to fit them so that they shall not bind across the upper arm nor be clumsy under the arm.

References.—Handy and Pract. Farm Libr. [Missouri], Mo. Bul., 13 (1915), No. 2. pp. 45–48; any fashion magazine.

Correlation.—Arithmetic: Calculate the difference in time and material required in making waists with different types of sleeves.

LESSON 155.

Problem.—To finish the neck of the waist.

Points to be brought out.—Waists without collars are comfortable and usually becoming. The neck should be neatly finished. A collar should not be so tight as to constrict the neck in any way.

Reference.—Textbook on clothing.

Correlation.—English: Describe women's neckwear in colonial times. Do you accept comfort as a fundamental requisite in selecting or designing clothing? Discuss this point.

LESSON 156.

Problem.—To wash and clean ribbon.

Points to be brought out.—The ribbons should not be rubbed. They should not be wrung out but dried between towels. A dry cloth should be laid over them in ironing.

Reference.—Rose, The Laundry, Cornell Reading Courses, 1 (1912), No. 11, p. 141.

Supplementary topic.—Discuss the place of decoration in dress. Is it the first requisite in clothing?

LESSON 157.

Problem.—The preparation of salad dressings.

Points to be brought out.—Salad dressings usually combine fat with an acid flavor. The fat separates from any liquid unless special precautions are taken to keep the two in combination. We combine them either as a temporary emulsion, or a permanent emulsion, or we keep the fat in suspension by thickening the liquid to which it is added with flour or with egg, or with both. Samples of all the typical dressings should be made. In some sections there is a great prejudice against the dressings made with oil. These should be made, but no one should be forced to eat them or even taste them. The students should understand that making mayonnaise with oil is just the reverse of churning.

References.—Textbook on foods; any good recipe book; U. S. Dept. Agr., Office Expt. Stas. Bul. 245, pp. 20–26.

Correlation.—English: Look up meaning of "emulsion." Study principles of homogenizing milk and butter to form cream.

LESSON 158.

Problem.—To finish the waist. Sew on buttons and make buttonholes.

Points to be brought out.—A neat finish adds materially to the appearance of a waist. To use pins instead of buttons and buttonholes is an untidy habit.

Correlation.—Arithmetic: Calculate cost of waist and the amount of time spent in its construction. Compare with estimate of money and time cost in Lesson 139.

Supplementary topic.—Discuss how much a mother's time is worth—to herself, her family, and society.

LESSON 159.

Problem.—Use the salad dressings prepared during Lesson 157 to make a number of typical salads.

Points to be brought out.—All salads should be cool and contain some crisp material. The crisp materials should not be combined

with the dressing until just before serving. Materials which are not crisp should be marinated (mixed with vinegar and seasonings or with oil, vinegar, and seasonings awhile before serving and allowed to absorb the flavor). Distinguish between a light and a heavy salad and the place each should take in the meal.

References.—Same as in Lesson 157.

Correlation.—English: List the different salads of which you have heard. Discuss the place of salads in the regular family meal. Suggest salads for special occasions. Describe one you wish to try when you get home.

LESSON 160.

Problem.—Making and remaking of sashes and girdles. The ribbons washed in Lesson 156 should be used.

Points to be brought out.—A little ingenuity will enable one to freshen up last year's girdle or to make or trim one out of odds and ends of suitable material.

References.—Current fashion journals.

Supplementary topic.—Discuss the economic aspect of storage in carrying over clothing from one season to another. Plan a record book suitable for your own home to show what clothing is put away and just where it is packed, so that it can be quickly found as needed.

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